

Neil Freeman

competition

ONTARIO HYDRO

Finding New Paths To The Customer

convergence

customer choice

Ontario Hydro Management's
Submission to the Advisory Committee
on Competition in Ontario's
Electricity System

January 25, 1996



700 University Avenue, Toronto, Ontario M5G 1X6

January 25, 1996

Dear Reader:

This edition of Ontario Hydro management's proposal for restructuring the Province's electricity services industry, which we have called "Competition, Convergence and Customer Choice", also serves as our submission to the Advisory Committee on Competition in Ontario's Electricity System, chaired by the Honourable Donald S. Macdonald.

We very much welcome and appreciate the Province's initiative, and that of our Minister, the Honourable Brenda Elliott, in setting up the Macdonald Committee to conduct its thorough and timely review. We will eagerly await the results of the committee's deliberations and the significant developments in our industry which will result.

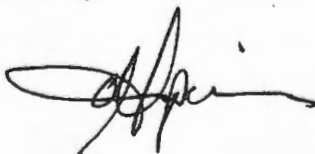
This version of "Competition, Convergence and Customer Choice" shows that our thinking has evolved since we last published on September 30, 1995. Some key developments include:

- we propose that the Central Market Operator (CMO) should be formed as an independent crown entity, with responsibilities to both manage Ontario's financial exchange for electricity, as well as system dispatch and security;
- in keeping with our vision of a full, retail access future, the Province should establish a single "Wires Company" with responsibility for Ontario's transmission and distribution networks, to act as a "common carrier" for the industry, and owned by those who have contributed its assets;
- we propose that privatization of our industry can most beneficially begin in the generation sector.

Readers will notice several other progressions in our thinking. As always, we contend that our views have evolved and will evolve as we learn more about markets for this unique commodity, and as we learn more about what our customers desire. The opportunity to discuss these issues with the Macdonald Committee and with other stakeholders over the next several weeks will no doubt refine our proposal further.

Mr. Macdonald has suggested that we in Ontario are faced with "an important opportunity to make a historic decision" to improve on an industry's architecture which has served the Province well for almost a century. It's a huge challenge that we are excited to be a part of.

Sincerely,



O.A. Kupcis
President and CEO



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I KEY ELEMENTS OF THE PROPOSAL

COMPETITION & INDUSTRY RESTRUCTURING

- Direct retail access by all customers to generators inside and outside of Ontario will begin in the year 2000.* (First Path)
- Customers can choose to join the Price Averaging Pool (PAP) which will supply them with electricity on the basis of averaged costs. (Second Path)
- A spot market in electricity will be established to be operated by an independent Central Market Operator (CMO).
- Agents (aggregators, marketers, and brokers) able to act on behalf of generators and customers beginning in 2000.
- A single WIRESCO to be formed from the current Ontario Hydro transmission and retail systems and municipal electric utility systems before the year 2000.

REGULATION

- The Power Corporation Act to be replaced by commercial legislation, and competition to be promoted wherever possible.
- Regulatory emphasis on equitable and fair competition.

- Generation prices to be determined by market. All generators to be subject to the same environmental governance.
- Wires tariffs (transmission and distribution) to be regulated through a form of incentive regulation.
- Rules of operation of the spot market and Central Market Operator, and principles of operation of the PAP, to be overseen by government.
- In the event of stranding, costs to be identified and recovered through a charge imposed by the regulator or by the government through taxation.
- Industry entry standards to be framed, and agents (aggregators, brokers, marketers) to be licensed.

OWNERSHIP

- Introduce private ownership, first in generation.
- Introduce private equity into Ontario Hydro International and Ontario Hydro Technologies.
- During transition to full competition, Ontario Hydro to be structured as Holding Company to facilitate future ownership transfer.

** Throughout this document, like its predecessor, the year 2000 is used as the key transition date to open retail access. This should be taken as notional only. Clearly, some time is required to change legislation, set rules, establish the players and the regulatory overlay, etc. At this time, the timeframe must remain flexible; it may take four, five or six years, depending on the objectives and the endpoint.*

II A PROPOSAL TO RESTRUCTURE ONTARIO'S ELECTRICITY INDUSTRY

This paper builds on its predecessor "Competition, Convergence, and Customer Choice" (September 30, 1995) which represented Ontario Hydro senior management's views as of that date. Our earlier paper noted that our views on restructuring would continue to evolve. This January 1996 update reflects further refinement in our thinking, as well as addressing questions raised in the Working Paper of the Province's "Advisory Committee on Competition in Ontario's Electricity System".

The industry structure proposed in this paper represents both a forecast and a preference on the part of Hydro's management: a forecast in the sense of presenting our views on how we see

inevitable forces of change operating on our industry; a preference in the sense of how we believe the impacts of those forces should be managed to benefit the people of Ontario.

WHY RESTRUCTURE?

The **purpose** of restructuring Ontario's electricity industry is to benefit Ontario and enhance its competitiveness.

There are three **key drivers** of change operating on the electricity industry. One is the development of competition. A second is technological change that has come about in both the generation and end-use of electricity, which is accelerating both competition and the convergence of

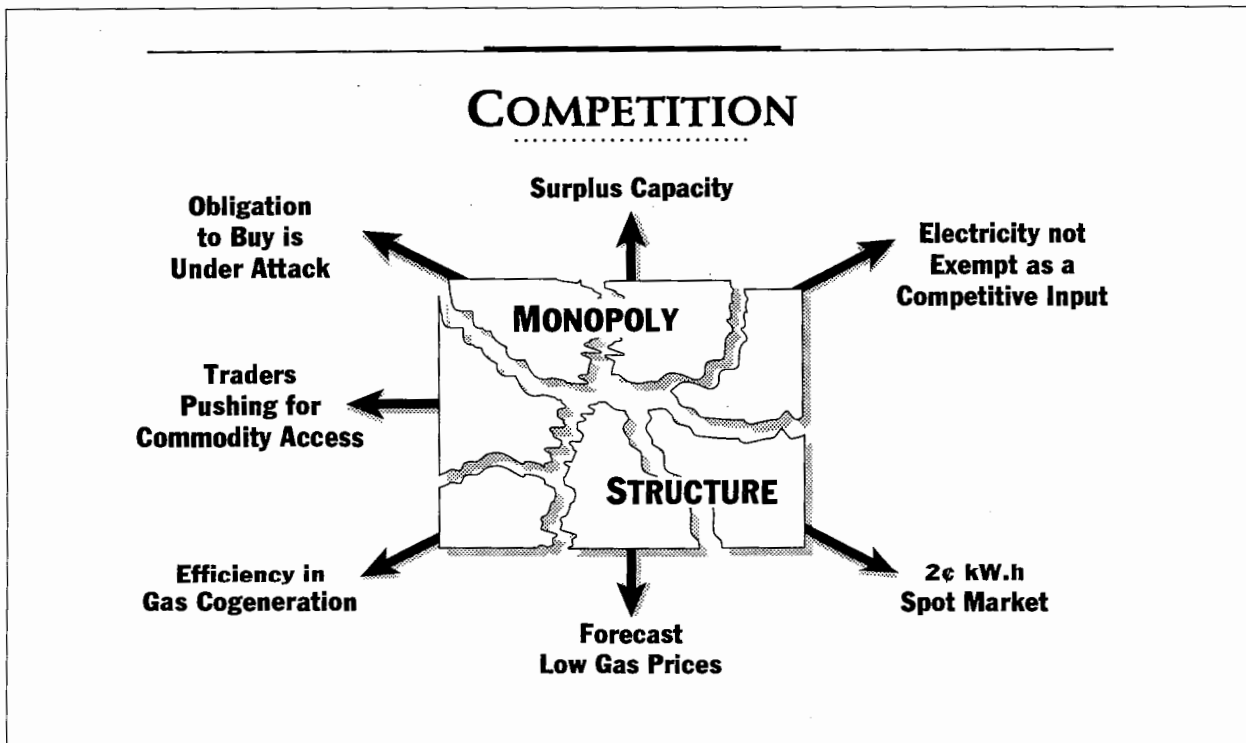


FIGURE A

electricity with other forms of services to homes and businesses, whether wired, wireless, or piped. The third is the advent of increasing demand for customer choice.

We believe that the forces of competition, technological change and convergence, and customer choice will inevitably bring changes to the structure of the electricity industry in Ontario. As stewards of Ontario's \$45 billion investment in electricity infrastructure, it is our obligation to advocate a responsible transition to the most likely future.

COMPETITION

The generation of electricity is no longer a natural monopoly structure requiring mega-plants, heavy capital investment, long lead times, and centralized and sophisticated technological know-how.

Competition is not a future threat to the monopoly structure: it is already here. Efficiency improvements in combustion turbine units, combined with low fossil fuel prices, mean that customers and independent third party generators can make electricity at rates competitive with, or better than, large centralized fossil and nuclear generating stations.

Another factor contributing to the increased pressure for competition is the development over the past 15 years of huge regional disparities in electricity prices across North America. With increased pressures to be competitive on a global basis, and with deregulation already a reality in former monopoly industries like natural gas and telecommunications, business

customers can no longer afford to have electricity exempt as a competitive input to their cost of doing business.

The existence of large capacity surpluses across North America means that wholesale spot market prices are low. In this economic environment, low-cost producers are anxious to get access to captive high-paying customers and vice versa. Consequently, the obligation to buy from a monopoly utility supplier is under attack, especially from large customers.

CUSTOMER CHOICE

Industrial customers in jurisdictions with high rates can pursue self-generation when rate relief is not forthcoming from their monopoly supplier. They are pushing for the right to choose their supplier.

Growing pressure for choice is also coming from commercial and residential customers. Choice is seen as an instrument for imposing the discipline and accountability of the market on electricity suppliers.

But choice is not seen solely as a driver of improved efficiency. The right to choose, not to be captive to a single supplier no matter how efficient, is valued by consumers as an end in itself.

The consumer desire for choice is a new phenomenon in the electricity business, but is well known in other industrial sectors where monopolies were once the rule (see Figure B).

There is not only growing consumer demand for **choice**, there is also growing consumer demand

EVOLUTION OF COMPETITION/CUSTOMER CHOICE IN UTILITY INDUSTRIES

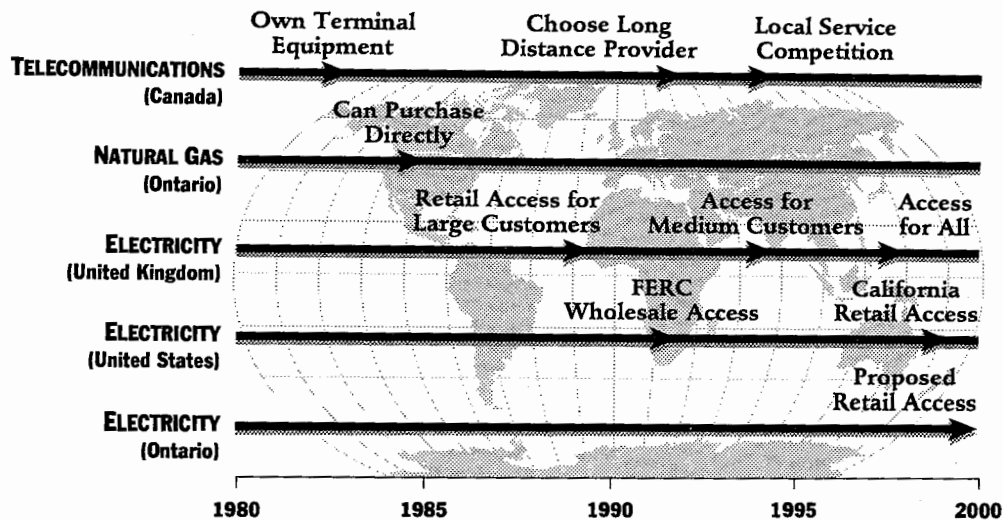


FIGURE B

for **choices**. Consumers want a wider range of products and services, including different rates and ways of billing (unbundling of products and services) at competitive prices. Many residential and small business consumers would prefer to see simple and understandable packages of rates and services, while some have expressed frustration at what they see as a baffling array of choices in long-distance telephone services for example. But indications are that very few of them would prefer to return to the monopoly world where what most people want everybody gets.

CONVERGENCE

The convergence of electricity with other industries is a force already apparent, although not yet pervasive, in some markets. Convergence refers

to "crossover" developments in previously distinct industries, technologies, and markets. In the past, there were separate suppliers of, and uses for, services such as electricity, natural gas, telecommunications and home computers and information systems. Increasingly, these services can be substituted for, or combined with, each other – for example home computers with electricity "smart" meters to control lighting and appliances, and monitor home security. Similarly, natural gas can add value to an energy utility because it can be stored to fuel electricity generators to meet peak loads.

Companies meeting customers' needs by innovatively combining two or three different kinds of supplied services will be attractive to tomorrow's customers. This will require far more flexible

forms of regulation (natural gas, electricity, and telecommunications are now regulated separately) and will require new and more flexible structures for the electricity industry, so that the resources of Ontario's investment in power infrastructure can be leveraged to effectively serve the future needs of Ontario's homes and businesses.

THE OVERALL OBJECTIVE OF RESTRUCTURING

These three main drivers of competition, convergence, and customer choice will inevitably push the electricity industry in Ontario and elsewhere toward change. In that context, what then should be the objectives of restructuring the industry?

We see the objective of restructuring as managing the impacts of the driving forces of change on our industry by introducing appropriate changes in the structure of the electricity industry, its regulation, and its ownership so that the Province of Ontario and its electricity customers will benefit.

If Ontario no longer has competitive prices in a North American market, it risks losing jobs.

From this broad objective we have identified a number of more specific objectives to guide and shape proposals on industry structure, regulation, and ownership.

KEY OBJECTIVES

1. Improve the efficiency of Ontario's electricity industry through introducing competition, where possible, and rationalizing the monopoly wires component.

2. Improve the prospects for long-term competitive electricity prices and improved service offerings to all electricity customers in Ontario.
3. Maximize customer choice.
4. Restructure the industry in a way that facilitates innovation and convergence.
5. Introduce competition in an orderly fashion throughout the industry so that the costs of past investments are not inefficiently by-passed and stranded.
6. Improve resource use efficiency, and reduce future environmental liabilities by promoting sustainable energy development.
7. Preserve the reliability of the electricity infrastructure.
8. Introduce regulatory processes which promote and facilitate competition while ensuring environmental performance.

The key issue in restructuring the electricity services industry is to find a way to overlay a fair, commercial marketplace onto a system which has been built to be complementary, not competitive, and onto an energy which follows only the laws of physics, not commerce. Unlike commodities such as natural gas, electricity can be neither stored nor switched. This unique nature means that new thinking is required in order to create an efficiently functioning competitive marketplace.

Our positions on the three key areas of interest to the Advisory Committee are broadly outlined in the following three sections. More detailed discussion of the rationale for and issues arising from industry structure, regulation, and ownership change are found in Chapters V, VI, and VII.

A. INDUSTRY RESTRUCTURING ELEMENTS OF THE HYDRO MANAGEMENT PROPOSAL

We propose that in the year 2000 any Ontario electricity customer of any size can directly purchase electricity from any supplier inside or outside the Province and/or from a spot market in electricity into which any generator could bid. Customers could use agents to make purchases on their behalf.

The spot market is essential for guaranteeing universally accessible market access for generators, and serving as a visible market window on where the market price for electricity is moving. The proposal is that the spot market be fully established in 2000.

Customers not wanting to shop the market for electricity supplies would automatically join a not-for-profit Price Averaging Pool (PAP) which would provide electricity on various averaged-priced or real-time bases for its members. This would be a second path, distinct from the direct purchase path. Customers choosing the Price Averaging Pool would not have the responsibility of arranging their electricity supplies. The PAP would have an obligation to ensure averaged pricing for any member who wishes to join.

HYDRO MANAGEMENT'S PROPOSAL

STRUCTURE

- End generation and retail supply monopolies

CUSTOMER CHOICE

- Can choose suppliers
- Can choose Price Averaging Pool

LEGISLATIVE CHANGE

- PCA replaced by Commercial legislation (like OBCA)

ACCESS

- Access to all customers
- Simultaneous, not staged

OWNERSHIP

- Introduce privatization in generation
- CMO as separate Crown
- Single Wiresco owned by asset contributors
- Private equity into OHII & OHT

TRANSITION TO FULL COMPETITION

- Establish CMO
- Establish PAP
- Establish Wiresco
- Multi-business holding company for OH

REGULATION

- For transmission/distribution tariffs

FIGURE C

Like competing agents, PAP would buy electricity from the spot market, and also shop the market to get the best deal for its members by buying contracted power. In order to avoid the risk of making power purchase commitments for customers who choose to leave the pool, the PAP could require its members to commit to a minimum membership period. The PAP could also offer members services such as energy management.

Agents, regulated through licences, would be free to contract with electricity consumers for purchases of electricity and/or energy services on mutually agreeable terms. They would form competition for the PAP.

Independent and utility generators inside and outside of Ontario would be permitted to sell by bid into the Ontario spot market, and to pursue sales agreements with any customer(s) in Ontario. The price of electricity would not be regulated, but determined by the spot market or by terms struck between generators and customers or their agents.

Restructuring would make a clear distinction between the regulated monopoly elements of the industry (such as the wires) and the competitive elements (such as sales, energy services, and generation).

A completely new company would be formed as a regulated common carrier, the "Wiresco". Its assets would comprise the publicly owned transmission and distribution wires systems in the Province. This new wires company would be a

share-capital structured company, owned by those who have contributed its assets. This ownership structure would not preclude privatization at some later date. Some regional disaggregation of this system into several units would likely be introduced to facilitate administrative and operational efficiency, particularly for distribution.

Ontario Hydro's retail utilities and the municipalities currently owning utilities would no longer individually own discrete wires businesses, but would own shares in the Wiresco. With the introduction of retail access, they would no longer own a geographically-defined customer franchise. The MEUs could compete with other agents and the PAP as buyers and sellers of electricity and as providers of electricity services to customers.

Charges for sending electricity across the wires infrastructure would be regulated and be distinct from the charges for electricity. The "wires" tariffs for this common carrier function would be regulated through a form of incentive regulation to drive efficiency.

The new industry structure would see the establishment of an independent Central Market Operator (CMO) under separate ownership from that of the Wiresco, the generators and retail suppliers. The CMO is envisioned to be a Crown entity. Its governance and rules of operation to ensure fairness and competition would include the involvement of an advisory body comprising representatives of generators, retail suppliers, customers groups, and the Wiresco.

The CMO would be responsible for soliciting and receiving bids from generators, and for the overall running of the spot market for electricity. It would administer settlements of market trading, manage integrated system security, and dispatch generation.

Retaining a central operating authority maintains the operating efficiency of Ontario's electricity infrastructure, and helps promote a reliable electricity system through centralized integration and control. It makes for better efficiency if the agent which dispatches generation into the wires is also the agent which has the market information on generator bids for price and volume.

Ontario Hydro International Inc. and Ontario Hydro Technologies would be separate businesses free to compete in a global marketplace. Their ownership would be increasingly transferred to the private sector.

A number of transition steps would be taken in the period 1996-2000 to support retail competition in the year 2000, including restructuring Ontario Hydro into a multi-business holding company structure to oversee the transition to direct retail open access. There will be competition in energy to supply the Ontario power pool. The CMO, PAP and Wiresco will be established. Rates for all customers will be capped, and the PAP will exercise some pricing flexibility to minimize short-term threats of stranded costs from industrial cogeneration.

RETAIL ACCESS FOR ALL CUSTOMERS IS REQUIRED BY THE KEY DRIVERS

Direct retail access will inevitably be required by

consumers of electricity services. Retail access initiatives in electricity services are gaining momentum in other jurisdictions and Ontario was among the earliest and most progressive jurisdictions in creating customer choice in natural gas.

Direct retail access, where the users of the services are the same people who get to say who will supply them, will drive efficiencies better than any other model. These efficiencies will, in turn, result in ratepayer benefit. Retail access is the friendliest model to convergence and competition, and is the only one that embodies real customer choice. The provision of the voluntary Price Averaging Pool accommodates those customers who wish to retain in most respects their current way of receiving and paying for electrical services.

Steps to the advent of retail competition include defining roles and rules so that customers and suppliers understand how competition will work, establishing new entities, passing new legislation, and putting in place the technology and infrastructure to access spot market prices.

THE IMPLICATIONS OF A RETAIL ACCESS STRUCTURE

The change from a cost-based monopoly structure to a price-based market structure is fundamental. Moving to competition carries with it an acceptance that all electricity customers across accessible market areas in North America will be exposed to similar potential price risks and price benefits.

Under a competitive market structure, individual advantages would show up in customers' ability to manage risks through hedging or contracts with

suppliers. Responsibility for what they pay for electricity would fall on customers' own judgments about markets, which is core to any market mechanism.

Such a change means giving up something. It means giving up cost-based rates defined by political jurisdictions. Where that jurisdiction has particular advantages, such as lower cost supplies of power, the benefits will no longer necessarily accrue to all customers within its boundaries. Instead, customers across Ontario could have responsibility for striking their own competitive advantages by buying shrewdly or selecting a prudent agent to act on their behalf. But the change for customers means gaining control and accountability, and being able to incent suppliers to better serve their needs.

We believe that the advantages of market and customer pressures driving innovation in services and tighter cost controls throughout the industry will far overshadow the transition costs of moving to a competitive structure.

B. REGULATORY RESTRUCTURING

In the emerging competitive environment, the more competition that can be fostered, the less need there is for detailed direct price regulation. The direction for regulation would increasingly take the form of oversight of the marketplace to ensure fairness and equitability.

There are three key regulatory problems that must be addressed in moving to a competitive open market. **Self-dealing** is a potential problem if Hydro-owned generators are competing to supply a Hydro-operated spot

market and where transmission constraints on a Hydro-owned wires grid could advantage some generators to the disadvantage of others.

Market power is a potential concern if Hydro continues to own the vast majority of generators supplying Ontario's needs. **Stranding of costs**, while not strictly a regulatory problem, is a potential problem whose remedy will likely involve action by the regulator. The problem occurs if assets funded by debt guaranteed by the Province cannot recover their embedded costs at competitive market prices. The regulator might have to determine which costs are legitimately stranded, and impose inescapable charges on customers/suppliers to ensure that the stranding does not occur, and that the debt does not have to be picked up by the taxpayer.

Our thinking on regulatory issues has evolved. The September report noted concerns about self-dealing if Hydro continued to own generation, the wires business, and the exchange/independent system operator (whose combined functions this report now refers to as the Central Market Operator - CMO). We now believe that mere structural isolation of the CMO function under Hydro ownership would not be sufficient to safeguard regulatory concerns about self-dealing. Accordingly, we propose that in a new industry structure, the CMO function be divested and wholly independent of Hydro and any other market participant.

Another regulatory concern noted in the September report was the dominant market power of Hydro in Ontario if Hydro were to continue to own its current generation facilities. However, the Report also noted that this

concern would be much ameliorated if markets in North America were to open across jurisdictional and geographic boundaries. Hydro management believes that North American markets will evolve in this direction.

Accordingly, the pressure to split up the ownership of generation solely for Ontario market power concerns is now seen as less important, and must be weighed against retaining larger blocks of generation sized to compete effectively in a North American market.

The stranding of costs remains a concern, but would diminish after the year 2000 if spot market prices increase as the market surplus declines. Where there is a potential for stranding costs, the regulator could impose charges on all customers, or the government could impose a stranding tax. In any event, stranding is a problem only of transition in the move from a protected monopoly to a competitive market situation. Once assets are sold to private investors, or the stranded costs are covered through some time-limited regulatory charge, the issue disappears.

In the proposed new structure, the primary regulatory function will be oversight to ensure that real competition is happening by discouraging anti-competitive behaviours such as the abuse of dominant market positions.

Regulation will be needed to ensure a level playing field for competitors, for example, in the assessment of the siting of new facilities. Safety and environmental regulation will be required to ensure safe and sustainable operations. But such

regulation might not take the form of "command and control". For example, tradable emissions caps and other market mechanisms could be introduced.

Tariffs for delivery of electricity over the wires, a natural monopoly component, would be subject to regulation through price caps or some other form of regulation that would drive efficiency and innovation. Since the wires would be common carriers for all suppliers, equal access and comparability of tariffs within regions would be key regulatory issues.

In addition to these structural elements, the entry of many new players into the electricity industry will require that technical standards to safeguard safety and operational efficiency be in place for all sectors. Brokers and agents would have to be licensed to standards of training and competence.

C. FINANCIAL RESTRUCTURING AND OWNERSHIP

The earlier versions of this proposal touched only lightly on financial restructuring and ownership. The proposal was designed to accommodate different ownership structures, and acknowledged that the ownership of the industry could change with many more players entering the field.

Trends toward greater competitive behaviour (such as the growing number of mergers and acquisitions involving electricity, gas, water, and other utility companies) will put new kinds of requirements on future electricity suppliers.

Because introducing new ownership helps facilitate the development of competition and because competition in the industry will happen first in the generation sector, we believe it is in this sector where privatization can most beneficially begin.

POSITION ON PRIVATIZING GENERATION

The position of Hydro management is that there is no longer a strong rationale for complete public ownership of the electricity industry in Ontario and that there are significant benefits to be achieved through private ownership of some parts. We see the value in privatizing or transferring to separate public ownership components of the electricity system where it will enhance competition and/or efficiency. A staged transfer of ownership to the private sector of many of the functions of industry should begin with generation. Government should also consider that deferring the privatization process in the face of competitive markets could increase the risks borne by the government and may put in danger realizing a fair value for past investments in the industry.

The transfer of generation assets to the private sector should follow definition of the industry structure, and associated regulatory and market rules. The exact configuration of the entities that are candidates for privatization requires further consideration and depends on the objectives to be achieved. In this paper (see Chapter VII on Ownership and Financial Restructuring), we outline some illustrative configurations which demonstrate how various, sometimes competing, objectives may be balanced.

The definition of objectives, and therefore the choice of divestment strategy, belongs to government.

Because Ontario's existing generation infrastructure has been built over the years to be synergistic and not competitive, the issue of how to best configure them for competition is complex. To face a North American market, they might best remain integrated. Privatization would then mean selling in tranches the shares in the integrated Genco. For a number of reasons to be discussed later, Nuclear generation should be kept intact, whether or not it is also combined with other technologies.

CHANGE OF OWNERSHIP

It is also possible to privatize the wires assets. However, the wires business would be a regulated common carrier under the new structure, and would benefit less from privatization, being a true monopoly. Furthermore, the wires businesses would be newly formed under a combined new public ownership and rationalized for efficiency. It would make sense to allow that new structure to be up and operating before considering privatizing.

There are other components of the current publicly owned utility that could be privatized, including Ontario Hydro International Inc. and Ontario Hydro Technologies. As with generation, we see benefits to the Province in the form of increased efficiency and innovation, as well as transfer of risk, in introducing private equity partners in these entities.

We propose that the Central Market Operator be established under separate crown ownership at arms length from generators and from the Wiresco.

IMPLICATIONS FOR ONTARIO HYDRO'S STRUCTURE

Ontario Hydro should be restructured into a multi-business holding company structure to oversee the transition to direct retail access. The structure would have separate subsidiaries for the generating companies, the Price Averaging Pool, the wires business, and the Central Market Operator.

Ontario Hydro's corporate efforts will continue to focus on the efficient and reliable operation of the electricity industry during the transition, and to ensure that the transition can be smoothly effected.

A multi-business structure permits setting up the new businesses, and divesting businesses to separate private or public ownership as appropriate.

B. ELECTRICITY'S ROLE IN ONTARIO'S COMPETITIVENESS

A necessary step in finding a model for Ontario's power sector that best serves Ontario's competitive position, is to first understand electricity's role in the province's economy. Accordingly, a macro-economic analysis was conducted by the Institute of Policy Analysis at the University of Toronto. The analysis yielded the following key points:

- Canadians are high per capita energy consumers;
- The electricity sector is of moderate size, characterized by high productivity and high investment;
- On average, the electricity price impact is relatively modest, although it is significant for a limited number of key industries;
- Competitiveness depends on many factors besides electricity price, among which labour costs and exchange rates are very important.

It must also be noted that in today's cost competitive world, all cost reductions are important. Viewing electricity as a controllable cost is a relatively recent business phenomenon, hence increased interest over the last ten years on energy efficiency programs and rate discounts. Information on costs as well as a customer's competitive position will be key components to a utility's success.

C. ONTARIO HYDRO'S FINANCIAL OUTLOOK AND OPTIONS

As an input to the analysis of restructuring options, Ontario Hydro undertook some background analysis to understand how the corpora-

tion and its assets financed through publicly guaranteed debt for the benefit of the Province's electricity consumers would fare under competitive conditions. In studying the impacts of introducing competition it is important to develop a base case to understand to what degree publicly guaranteed assets would be at risk and have value. Similarly, to understand potential share value and market worth for privatization, it is important to assess Hydro's competitive situation and potential for stranding costs.

This and sections D and E present such analyses.

If exogenous influences (such as regulation, industry structure, etc) could be frozen in time, the financial outlook for Ontario Hydro, or its successor entities, over the next 10 years is very positive. However, this long-term projection of financial performance depends on several very important assumptions, in particular the adoption of the "most probable" median load forecast (on average 1.5% growth per annum over the forecast period), a continuation of the current access rules, nuclear performance at about 75% average capacity factor, and a pricing strategy of "no change" in average nominal electricity rates. Under these assumptions, many of which can be challenged, average rates will decline in real terms by 18% over the period ending 2004, and debt declines by 45%, driving an improvement in the debt-to-equity ratio from the current 0.89 to 0.53.

Driving this strong performance is the fact that with the Darlington Generating Station and other highly capital-intensive assets fully in-service, large depreciation charges are now being recovered through rates. Since system expansion has

III BACKGROUND TO THE PROPOSAL

A. THE PATH TO DATE

Late in 1992, Ontario Hydro recognized the need to change. The factors leading to this conclusion were: a decrease in sales since 1989; a large capacity surplus expected to last until the end of the decade; rapid increases in the price of its product; and dissatisfied customers.

Starting in 1993, Ontario Hydro took corrective action. It committed to no real rate increase for the balance of the decade; reduced staff by 25%; reduced Operations, Maintenance, and Administration (OM&A) costs by \$600 M; reduced the 10-year capital program from approximately \$40 billion down to under \$13 billion; wrote off assets and cleaned-up the balance

sheet; restructured along business lines; instituted pay for performance for executives; instituted an electricity exchange and an internal transfer pricing mechanism to send market-like signals to generators; recruited new people for the senior management team, several with private sector experience; assessed Hydro's competitive position in relation to an open market; and analyzed the vulnerability to stranding investments under competition. (See Figure D)

In many ways, Ontario Hydro has just about exhausted the matters over which it has control, hence this proposal for industry restructuring which requires government support to make Ontario more competitive.

IMPROVEMENTS MADE WITHIN CURRENT STRUCTURE

	1992	1995
Staff Levels	29,000	22,000
GW.h/Employee	4.5	6.3
OM&A	\$2.2 billion	\$1.7 billion
Capital Spending	\$3.0 billion (<i>actual</i>) \$40.0 billion (<i>planned 10 year</i>)	\$1.1 billion \$13.0 billion (<i>planned 10 year</i>)
Net Income	\$312 million	\$600 million
Total Debt	\$35.6 billion	\$33.3 billion
Rate Increase	11.8%	0.0%

FIGURE D

stopped and capital expenditures have been dramatically reduced, holding electricity rates at current levels will generate sufficient cash flow (essentially net income plus depreciation less capital expenditures) to reduce long-term debt by \$8 billion by the end of the decade.

The sensitivity of results to variations in assumptions was tested using the base case financial outlook. Variations in economic conditions reflected in changes to interest and foreign exchange rates and sales of electricity were introduced. Of the three, the impact on the sales forecast was the most significant. A pessimistic economic outlook combining the three factors shows net income remains positive, but drops from an average of \$1.4 billion/yr to \$300 M/yr. Even so, this net income, with cash flow from depreciation less low capital costs, still improves the debt ratio to about 0.80 by 2004.

The effects of competition were tested by assuming a loss of 20% of total load over three years starting in 1997. Net income dropped an average of about \$1.6 billion per annum, resulting in a net loss of \$0.5 billion by 2004. As a result there was little improvement in the debt ratio over the period.

Another major assumption is an average nuclear capability of about 75%. Sensitivity to a curtailment in nuclear production was tested by assuming a loss of 2100 MW of capacity beginning in 1995 (roughly the size of the Pickering A plant). Net income decreases by an average \$800 million per annum but remains positive throughout the period. Excluding any write-off of capital, the corporate debt ratio still improves to 0.74 by 2004.

The above sensitivity analysis does not take into account the positive potential impact of competition and/or ownership on the cost effectiveness of the business.

In summary, if generation – in particular nuclear generation – performs to plan, and if the system does not suffer a loss of market share or revenue erosion because of greater access or self-generation by customers, then the financial outlook is very positive. Indeed, with its much reduced capital program, a significant level of cash flow is produced which would enable the retirement of much of the outstanding long-term debt over the next 10 years. However, it is Hydro management's view that markets will and should be opened in the year 2000; therefore the utility of all forecasts past that date is limited.

D. ONTARIO HYDRO'S COMPETITIVE POSITION IN BULK ELECTRICITY SALES

As the major supplier of electricity services to the people of Ontario, and as stewards of its publicly-owned assets and infrastructure in electricity, the capability of Hydro and its successors to be competitive in an open North American market is very important to the Province's competitiveness, regardless of the kind of structural or ownership change that may be forthcoming.

In assessing Hydro's competitive position it is important to distinguish between the traditional wholesale market and the reality of the new and emerging markets for electricity. The traditional market has vertically integrated utilities which wholesale bulk electricity to regional distributors,

which resell a bundled product to "full requirements"/captive customers. In contrast, the emerging market is much more diverse and dynamic, segmented by product-type with rebundled packages, including cross-sectoral services, and driven by customer choice. It will be difficult for any single utility to dominate all markets – a short-term or spot market for energy, a long-term contract market for firm capacity and energy, and a market for transmission and ancillary services, including back-up, standby power, voltage support and other services.

There is a near-consensus within the industry and the financial community that future success in a competitive environment will depend on two fundamentals which serve successful utilities equally well in both the monopoly and competitive markets. Moodys Investor Services believes that the successfully-positioned utility will be first and foremost the low-cost supplier at the margin. However, of equal importance is the need to have imaginative and innovative marketing strategies to attract and retain a diverse base of customers.

Moodys analyzed the steps which successfully positioned utilities have taken to prepare themselves for competition. In general, Ontario Hydro has already acted on the majority of initiatives recommended by Moodys as necessary first steps to prepare for competition. It has: (i) reduced controllable cash costs; (ii) re-organized and re-engineered to promote efficiency & accountability; (iii) re-structured along business unit lines; (iv) introduced internal competition through transfer pricing; (v) changed cost allocation to make costs more transparent, remove cross-subsidies, and facilitate service unbundling; (vi) devel-

oped customized rate options in response to customer needs; (vii) committed to no real rate increases; (viii) written-off over \$3 billion in "soft" assets and costs, thereby putting financial books on a more commercial footing; and (ix) recognized the need for cultural change and acquired new leadership to drive these changes. All of these changes are compelling evidence of the extent to which Ontario Hydro has prepared for the challenges of greater competition.

Within this context of change, both within the Corporation and the marketplace, Hydro's competitive position can be viewed broadly in terms of opportunities and threats in both the domestic (Ontario) wholesale bulk power market as well as the neighbouring US and interprovincial markets.

The opportunities for Hydro to increase its market share in Ontario are limited – by virtue of its near-monopoly status. Hydro already serves 94% of the domestic market with primary sales in 1994 of 130 TWh, the balance being provided by self-generating customers and other non-utility generators.

Opportunities in the broader US regional market are more attractive. In this market, defined as Ontario plus the service territories of the 32 utilities within two "wheels" of Hydro's interconnection ties, Hydro currently has less than 20% of the market. In 1994 Hydro exported a record 12.6 TWh into the US northeast, earning roughly \$350 million in revenue. Export sales declined slightly in 1995 to 9.2 TWh which produced \$233 million in revenue.

Opportunities for increased exports may exist in some of the following markets: (i) spot or short-term sales of energy to other utilities; (ii) longer term contracts for firm power; (iii) displacement of higher cost oil generation; (iv) municipal utilities and rural coops recently granted wholesale access and now, "shopping the grid", ie, looking for alternative lower cost suppliers and increased opportunities for municipalization; (v) summer diversity sales; (vi) opportunities arising out of the US Clean Air Act Amendments; and (vii) early retirements of older and uneconomic fossil and/or nuclear facilities in neighbouring states.

The prospects for future growth as a result of these opportunities depend on Hydro's competitive strengths and weakness in these markets.

Hydro's strengths would include: cost competitiveness relative to US suppliers; regulatory change in the US which allows Hydro access to US wholesale customers; aging plant in the US market which might make Hydro generation a viable alternative to local rehab/repowering; Hydro's environmental performance in acid gas emissions which is superior to US generators; seasonal diversity between the markets; and Hydro's solid reputation as a reliable supplier.

On the downside there are many obstacles to Hydro expanding its market share. These include: the restructuring and acquisition of market power through mergers and the acquiring of transmission access by US utilities; many new players in the marketplace in the form of

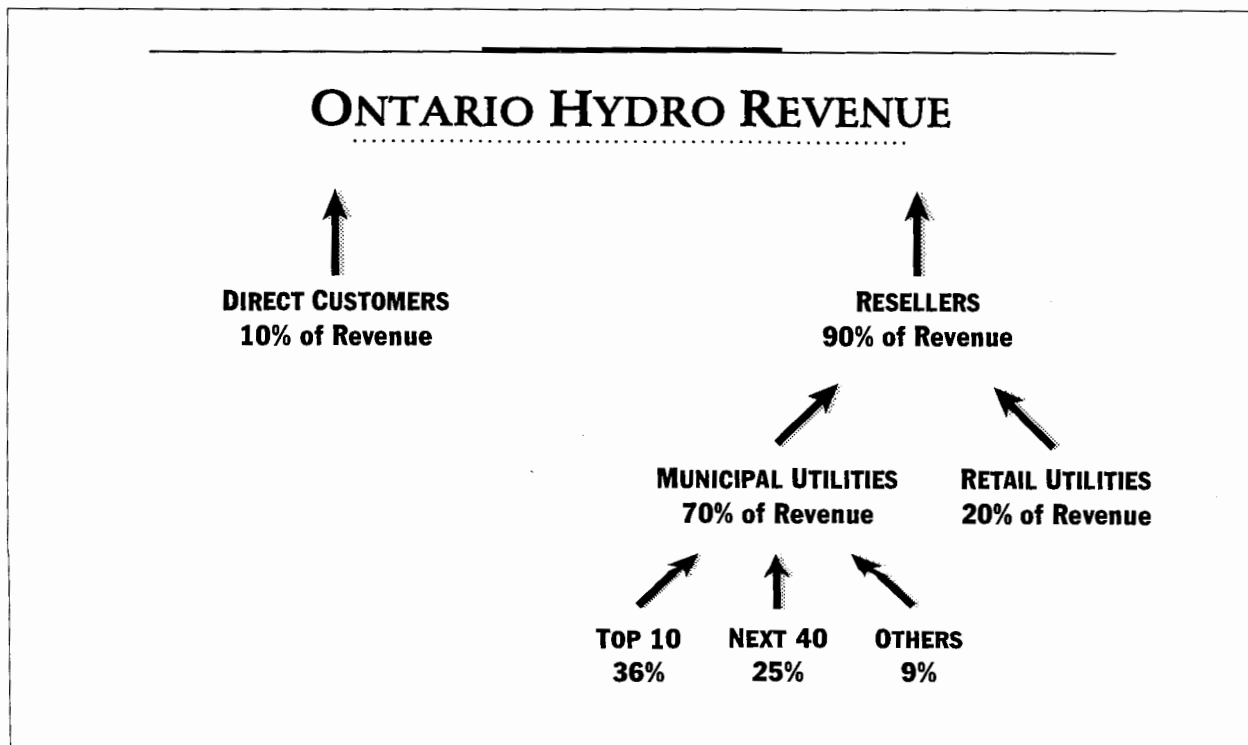


FIGURE E

marketers and brokers, and soon financial players; utilities tying up their most vulnerable customers with lower priced long term contracts; limited transfer capacity and transmission bottlenecks within the US market area; weak load growth among US utilities; and soft natural gas, oil and coal prices which make local generation more competitive.

By far the most significant consequence to Hydro of opening bulk electricity markets to competition is the threat of revenue erosion. This could occur as a result of three main threats: (i) self-generation by customers; (ii) peak-clipping municipal utility generation; and (iii) the threat of US generators selling in the Ontario market.

Customer self-generation in Ontario remains a threat despite moderating trends in recent years. These trends include the fact that electricity prices have stabilized and the commitment to no real rate increases to the end of the decade has removed much of the uncertainty and motivation underlying the self-generation option. Similarly, there is uncertainty over the future price of natural gas – it is difficult if not impossible for self-generators to obtain attractive long-term fixed price gas supply contracts. Hydro rates for back-up, power quality support and other ancillary services will detract from the financial feasibility of customers building their own generation. And finally, many customers are generally looking for less risky supply options than self-generation, and with the prospect of competitive markets and lower rates, customers will be generally reluctant to invest in self-generation. Nonetheless, Hydro has had to

take steps to protect about 600 MW of domestic load recently.

Municipal electric utility peak-shaving generation could result, in the extreme, in a potential load loss of 2800 MW by the year 2000. The MEUs most apt to pursue this route are those with “peaky” loads, access to concessionary financing, the technical capability to monitor load and manage the timely dispatch and operation of such units, and an aggressive entrepreneurial outlook. This threat could be minimized by Hydro adjusting its rates in a manner that removes the rationale for peak clipping.

The final threat to Hydro’s competitive position is the prospect of US utilities successfully marketing power in Ontario before a comparable level of access is available to the US markets. If Ontario moves quickly to open access to supply Ontario customers, without dealing with the issue of stranded costs, and before retail access is implemented in the US, some US utilities would be well positioned to “cherry-pick” specific customers from the Ontario Hydro public power system.

If Hydro rates are compelled to reflect system average costs, as they are now, (see Figure F), US utilities would be able to selectively undercut Hydro prices and take market share, even if the average rates of the US utility were significantly higher than Hydro’s. (see Figure G)

US utilities, in the main, are retail utilities – on average only 10-15% of their total sales are wholesale, and therefore they recover most, if not all, of their fixed capacity costs from their

ONTARIO HYDRO 1994 PRODUCTION UNIT ENERGY COSTS

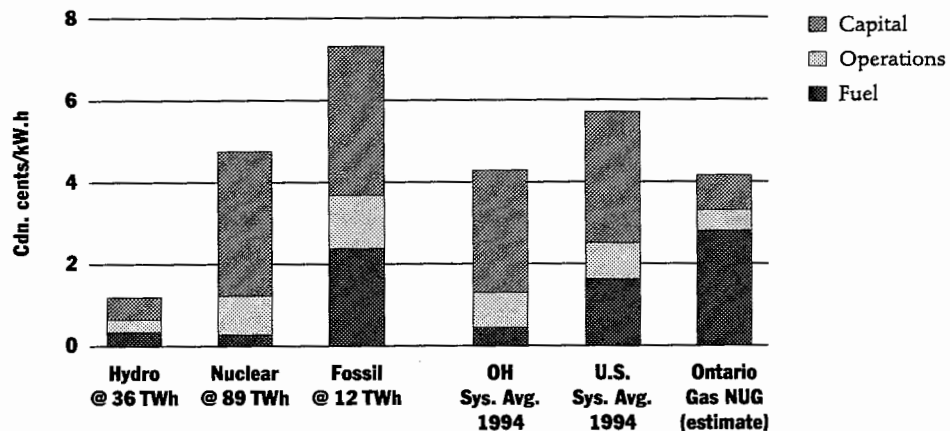


FIGURE F

captive full requirements customers – much the same way that Ontario Hydro does from its MEU wholesale customers. They are therefore able to sell surplus energy in the secondary interconnected market on a “salvage” basis, priced at or slightly above their marginal production cost, ie, fuel plus variable operations, maintenance, and administration (OM&A).

If Hydro had the pricing flexibility to negotiate rates to meet the competition, it could, by virtue of its very low marginal production costs, respond selectively with lower rates. However, the revenue loss in doing so could be significant. Because Ontario Hydro is basically a wholesale utility with 90% of its sales to wholesale customers, the playing field is heavily tilted in favour of US utilities. Hydro is therefore vulner-

able under open access scenarios unless it can “lock-in” a greater proportion of its load, or unless the US also moves to retail access where its own customers can be courted by other utilities, including Hydro. (see Figure H)

On a level playing field, Hydro is well positioned to compete. A competitive exposure analysis conducted by Resource Data International (RDI) found that of the 32 utilities in the Ontario northeastern US market area (excluding Quebec), Ontario Hydro was the lowest cost generator at the margin. Because of Hydro’s generation mix, predominantly nuclear and hydroelectric, the Corporation’s fuel and variable OM&A costs are extremely low. RDI also found that on the basis of system average total unit energy costs (TUECs), Hydro is

U.S. AVG. GENERATION COSTS - 1994

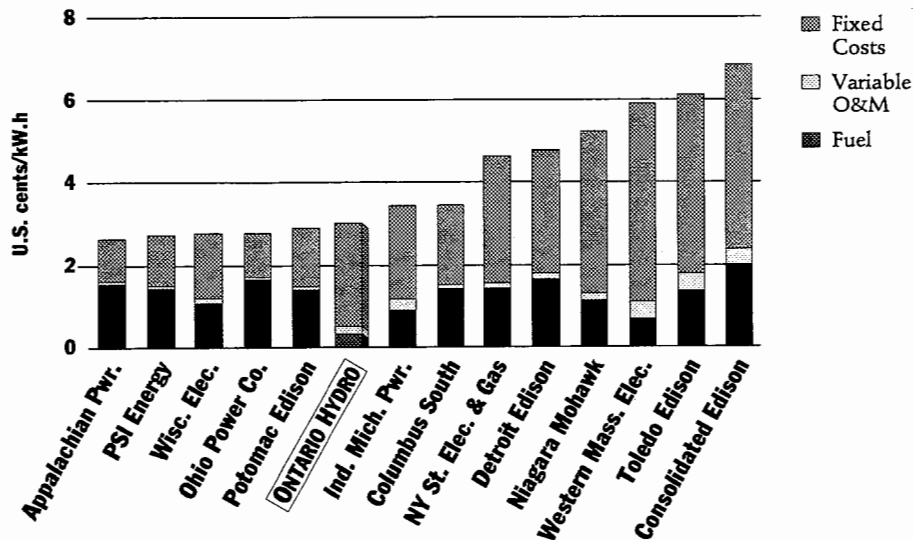


FIGURE G

currently among the most cost-efficient producers and therefore highly competitive with US generators. This relationship is reflected in customer rates. On an average price basis, Hydro is price competitive with scheduled US tariffs. However, US regulators are increasingly allowing special contract rates between utilities and large customers.

Hydro is currently in a favourable competitive position. If it is to maintain that position it must (i) remain cost competitive by reducing further its fixed costs; (ii) manage the transition to a competitive market and achieve more pricing flexibility; and (iii) focus on becoming/remaining the supplier of choice. If Hydro continues on the course, preparing for competition, fostering a stronger commercial orientation while pursuing

ongoing cost control, it should be able to thrive and find new opportunities.

E. ONTARIO HYDRO'S VULNERABILITY TO STRANDED COSTS

Stranded costs arise when a utility's embedded costs become uneconomic as a result of a transition from a regulated monopoly to a competitive market place. Stranded costs could include the utility's past generation investments, non-utility generation (NUG) power purchase contracts and public policy driven programs such as demand side management. These investments, made in an era of cost-of-service regulation, may not be recoverable from customers in a competitive power market. It is important to note that stranded costs or transition costs are not new costs imposed on customers who desire choice

THE IMPORTANCE OF REGULATORY DEVELOPMENTS IN THE U.S.

Evolution Towards Retail Access: Ontario And The U.S.

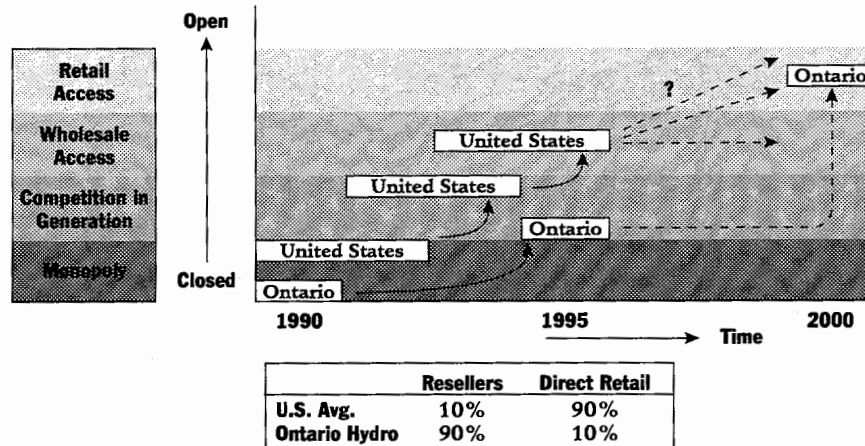


FIGURE H

in power suppliers. Rather, stranded costs are costs which customers are currently paying and which some customers might try to avoid in a transition to a competitive market.

The issue of stranded costs arises when considering decisions to restructure the electricity industry, to provide nondiscriminatory open access and to create competition in generation.

From an Ontario perspective, alternative mechanisms for dealing with stranded costs may apportion the burden differently between customers and the Province (debt guarantor), but the total cost will be borne by the taxpayer and/or ratepayer, either directly through electricity rates or indirectly through increased taxes. It is likely that the Province would not want to

raise taxes in order to lower electricity rates, and therefore would seek out options that allow the recovery of stranded costs in electricity rates.

A critical factor underlying the costs of stranded costs is the relationship between future market prices for electricity and a utility's total unit energy cost (TUEC) of generation. To the extent that competition leads to lower prices, it could also lead to stranding. On this basis, estimating stranded costs therefore requires estimating future market prices. However, there is considerable uncertainty as to the level at which market prices will settle. The most prominent reason for this is that the future industry structure is currently being debated. Other factors include: government decisions, regulatory intervention, the level and duration of surplus capacity, the

EMBEDDED GENERATION COSTS VS. POTENTIAL MARKET PRICES

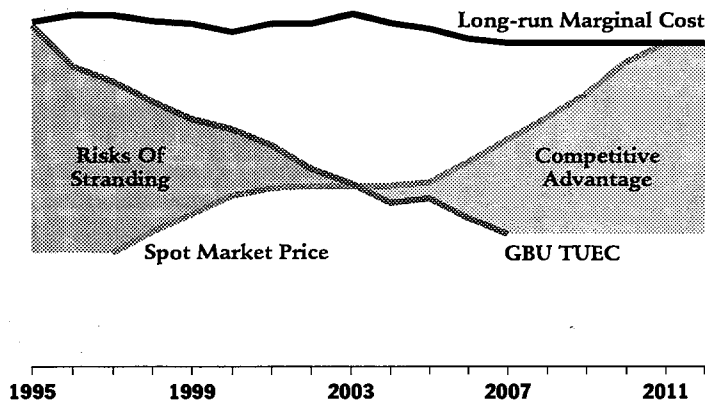


FIGURE I

degree of market power of suppliers and buyers, the relevance of transmission or physical constraints on the system, the price of alternative fuels such as natural gas, the rate of load growth, competitor responses, the proportion of the market in long-term contracts vs. the spot market, and advances in generation technology.

However, bounds can be placed on future market prices. The ceiling price for long-term energy and capacity contracts will likely be set by the levelized unit energy cost (LUEC) of a combined cycle gas turbine (CCGT) unit, which tends to be the most competitive technology for incremental capacity.

The floor price for electricity will be set in the spot market. Spot market energy prices are

generally set equal to the marginal fuel cost of the most expensive unit in the market. At this price generators are earning essentially a zero recovery of capital costs – a situation made possible by surplus capacity and differences between demand/supply imbalances in competing markets, and a situation which is not sustainable in the long term. As the surplus capacity is absorbed by the system, two phenomena will likely push-up spot market prices: (i) risk averse customers will increasingly be willing to pay a premium to secure price and supply assurance, and (ii) the marginal cost of energy will increase as more expensive plant is brought on-line.

The Province of Ontario would be best served if competition were limited to energy spot markets

during the period of capacity surplus. In Figure I, Hydro's Total Unit Energy Cost approaches the anticipated spot market price and crosses over in 2003. This results in the lowest total cost of providing electricity to the economy as a whole, and avoids shifting costs from ratepayers to taxpayers. It encourages economic bypass of Ontario Hydro generation (i.e. when a competitor's marginal cost of generation is lower than that of Hydro) and discourages uneconomic bypass.

Introducing competition in energy and capacity in about five years might allow market prices to increase as surplus capacity is absorbed, and allow Hydro to reduce embedded costs. This projection on the general direction and timing of future market prices is, of course, reflective of a number of assumptions which could be challenged.

F. INDUSTRY CONVERGENCE

As customer needs evolve, traditional industrial sectors adapt by blending, merging, and creating wholly new sectors. Cable TV and telecom, banking and insurance are two examples of industry convergence.

As mentioned earlier, convergence refers to the crossover of previous distinct and discrete industries. Convergence can affect the electricity industry in various ways and stages. In the first stage, it can be driven by "competition at the meter". This would show itself as the momentum to develop a strong customer focus, unbundle services, restructure rates and emerge as the marketer of choice. This stage is driven by marketers who can be new entrants into the

industry and who shape the expectation of customers so that existing industry players must follow.

The second stage could involve increases in collaboration and inter-industry trading. For example, gas turbine plants (20 to 200 MW in capacity) could improve efficiencies and costs in electricity generation just as electrotechnologies and electronic equipment could improve productivity in the gas industry. In addition, large gas producers are likely to get into the gas-electricity manufacturing function and operate "merchant plants".

A third stage of convergence is related to the development of consumer choice driving the development of new technologies for end use applications. Fuel and appliances could be developed into more cross-overs. Gas technologies and electrotechnologies would then compete for customer loyalty and purchasing appeal. Pressure would mount to reduce or eliminate products and business structures such as monopolies that were not responsive enough to consumer preferences. In time the boundaries of the two industries would blur into one energy sector. Combined utilities that deal in electricity and gas have long known the potential advantage. Hydro Quebec is a new player in this area; in response to a business strategy which sees Hydro Quebec's future as an energy storage service, they have entered into a strategic alliance with a provincial gas distributor and an American gas producer and storage business who has contracts to supply generators in the northeast US.

EXPANDING THE VALUE-OFFERING TO THE CUSTOMER

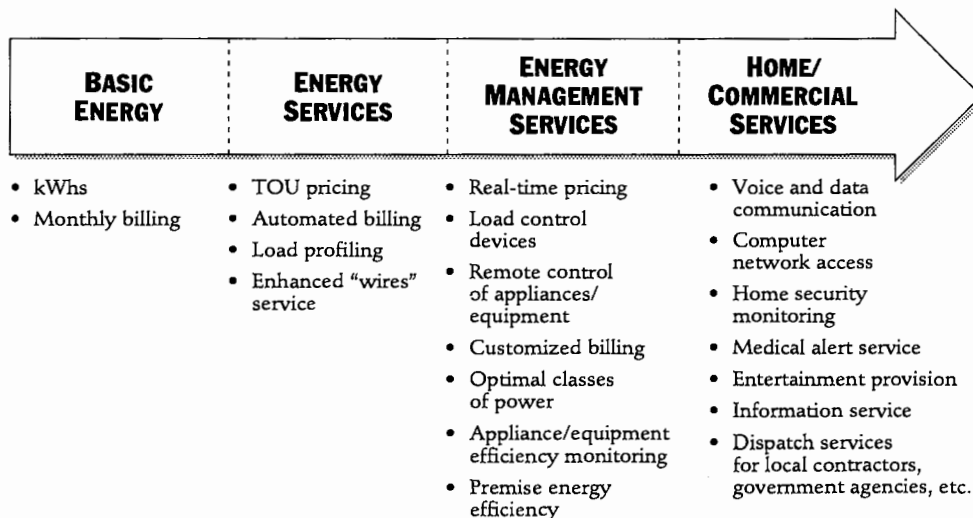


FIGURE J

Companies with expertise in bulk transmission, long distances and linkages to the production function can build on these to specialize in large scale activities.

Both the gas and the electricity areas are learning how the features of each other's industry can increase their own efficiency. For example, distributed generation, (ie., smaller, customer-sized generation or cogeneration located close to the load it services) employs gas and diesel oil fuelled technologies extensively and advantageously. In fact, one of the rationales for the location of distributed generation units is cost effective access to the fuel source. Although distributed generators will most frequently be located near the customer or local market, gas and electricity business interests will have more

closely entwined roles in future supply.

Competitive gas companies such as Westcoast and TransCanada Pipelines are already in electricity generation in Ontario and the US market.

Another important and potential area in which convergence could occur is the information highway. This relationship is alive by virtue of the wire and fibre optic networks already needed for electricity system protection and control. Convergence of other wire carriers and content provision companies are well underway. In Canada, concern about the process of converging is reflected in the active role the CRTC is taking in overseeing the restructuring of the broadcast, cable, and telephone industries in a formal and staged way. Unlike Canada, the review of telecom legislation in the US has

directly referenced the electric utility industry. However, the CRTC review on convergence has emphasized consumer choice and competition, similar to the prime drivers reshaping the electricity industry.

The electricity industry has an opportunity for proactive participation in the telecommunications realm related to its own unbundling and repackaging of energy and other services. In this case, information or intelligence is a key contributor to the "customer choice" driven future where information about choices of supplier or distributor, products and services, and nature and degree of risk will be required. A future competitive market could have these and other retail services provided by many parties: marketers, brokers, amalgamators (including the Price Averaging Pool), as well as generators.

Depending on the arrangement of transmission and distribution linkages, the electric utility can also readily serve the common carrier function; an integrated system would be the most efficient, effective and economic. Provinces such as Quebec and British Columbia have a natural advantage as these two roles are under the aegis of one company, in these cases, the main provincial utility. The appropriate separation of content (eg. billing information and other customer characteristics) and carriage (eg. the supply, operation and maintenance of the electronic capability) is and will be a CRTC concern. The current telecommunications industry has found ways to aggressively court customers as well as to dodge competitors. Marketing innovation and new approaches to interface and input/output devices will bring capital from

other industries such as appliance manufacturing into play, adding to the potential for financial restructuring of an electric utility business such as Ontario Hydro.

A third and traditional area for convergence is between electricity and other utilities such as water or municipal services including environment and waste management (eg, energy from landfill gas). Movement in this direction has largely been influenced in the past by municipal councils or other business interests rather than arising from consumer preferences

Ontario municipal governments are considering the advantages of public/private partnerships for infrastructure and utilities. Already planned for pilot projects are meters with ports for electricity, gas and water. Signs of interest have developed among established gas pipeline and distribution companies and new ventures are being considered for expansion into the traditional public sector realm of water provision. The pressure on lower tier governments to rationalize and restructure, at least in the Greater Toronto Area in Ontario, could lead to the movement of public sector responsibilities into the private sector, the development of regulated and/or competitive markets and the entry of innovative new players.

There are risks associated with convergence. Customer preference is highly uncertain for products and services which do not currently exist. There is also a high technology risk associated with the investment required for telecommunications infrastructure, the development of interactive and smart interface devices or

forward or backwardly integrated gas activities. In the gas and telecommunications areas, competitors have already begun to intrude into territory considered a natural for electricity companies. Hence, risk is associated with both acting and not acting.

ASPECTS OF CONVERGENCE

- among energies upstream
(using gas and electricity interchangeably)
- among energies downstream
(dual energy systems)
- between upstream and downstream
(generation at customer's site)
- among customer sectors
(industrial/agricultural/commercial)
and primary and secondary
- among industrial sectors
(energy/telecom/cable/security/
computer/entertainment)

G. CONSUMER VIEWS AND VALUES CONCERNING ELECTRICITY

Ontario Hydro's research indicates that customer priorities in Ontario Hydro are the same as in many other jurisdictions: reliability, low rates, safety and the environment, customer responsiveness, and efficiency and good management.

Generally, customers do not perceive that Ontario Hydro has competitors. Consumers want Hydro to act competitively, although not necessarily be in extensive competition with many others. Competition is generally viewed as a way of keeping Ontario Hydro from being complacent and inefficient. Competition is viewed as a way of helping keep the price of electricity down.

In Ontario there is little evidence of enthusiasm for increased third party regulation of Hydro to protect consumer interests. Ontarians are generally interested in end results, not means. Regulation is not seen as the answer.

There is strong support by customers for continued public majority ownership of Hydro. The customer attitude research indicates that there is moderate support for selling part of Ontario Hydro as a means of introducing competition. The sale of international business and energy audit service receives the greatest support. There is far less support for selling off Hydro's assets, particularly nuclear (safety concerns) and grid (considered a natural monopoly). The public wants the proceeds from any sale of assets to be applied to Hydro's debt.

Ontarians will tolerate some degree of customer class cross-subsidization, provided that it is made explicit and public and that it truly serves those that need it. The major appeal of a framework with pooled and averaged costs is that small and medium business customers do not want divergent electricity rates to be a distinguishing feature of their competitiveness.

Customers demand reliability and quality of service, but about a third of small customers and about half of large power users in Ontario continue to be concerned about Hydro's ability to meet long term demand in Ontario.

Over the past several months, Ontario Hydro has been engaged with end use consumers (small industrial, commercial and residential) in Consumer Panels in Ottawa, Toronto, London and Sudbury.

Several themes and consumer perceptions arose from these meetings, consistent across the Province.

1. Competition is Good, but Debt Must be Paid

- Conceptually, competition is seen as healthy. It would force Hydro to think and act more efficiently and have a greater consumer focus.
- Given excess capacity and the \$35 billion debt, panel members worried that competition could seriously hinder Hydro's ability to service its debt payments, and this would have an impact on them as taxpayers. Therefore, Hydro should be wary of entering

into any form of competition that could threaten its debt payment ability.

- There was also concern that a competitive model would make electricity less available and affordable for hard to serve areas.
- Competition from the private sector does not guarantee lower prices.

2. Support for Competition in Generation

- With 70% of electricity's costs in generation, most thought that this was the best place to encourage competition as it had the greatest opportunity for cost savings and would have the least impact on service reliability.
- However, the key element of concern in any movement towards a competitive environment related to the fear of stranded costs increasing the liability of the Ontario taxpayer. A majority of panel members expressed the strongly held view that, until Ontario Hydro was in a more financially secure position with the debt-to-equity ratio significantly lowered, competition should not be encouraged, particularly in generation.
- It will also be important that competition be visible to the end consumer. Many consumers did not see it as competition if competition in electricity only occurred in generation to supply the Province's power pool, especially if Hydro managed the pool and selected which generators contributed to it.

- Panels saw a lot of appeal in promoting local power generation:
 - less lead time to design and build, so less reliance on demand forecasting
 - lower cost to operate
 - provide jobs in the communities
 - provide service directly to consumer
- The need to seek out opportunities to use alternative renewable energy sources was stressed.

3. Rationalization of Distribution (Municipal Utilities)

- Throughout the province, panels questioned the value added of two “tiers” in distribution. There was a general view that municipal utilities may just add another layer of bureaucracy and cost. With or without competition, distribution should be streamlined – removing a layer rather than adding more. Rationalization would create cost savings and a greater consumer focus for Hydro.
- Panel members felt that there was no need for any competition in transmission. They did not believe that it would be cost effective to have different companies compete in the wires end of the business.

4. Consumer Choice and Flexible Rates and Services

- Consumers supported the concept of more choice in suppliers and services. They felt there was a lot of room for Hydro to give consumers more choice in how and when they use energy, such as lower rates in off peak hours.

- However, unlike the situation with other utilities (telephone, gas), panel members saw electricity as only one product rather than several discrete services that can be unbundled.
- There were mixed views as to whether large customers should get volume discounts. Some saw the “trickle down” benefits of keeping Ontario industries financially healthy and in Ontario, whereas others thought that if big business paid less, small consumers would have to pay more to make up the difference.

5. Privatization Should Also be Considered

- Privatization (or at least profit centres) of some of Hydro’s less efficient generating stations could meet the goals that they felt were important – keeping Hydro cost-effective and more accountable. However, some panel members were concerned that, in the current surplus situation, a ‘fire sale’ might occur which would reduce the value of the assets built up over time by Ontarians.

6. Need for Greater Accountability/ Oversight of Hydro’s Activities

- Across the province, the view was that no one was watching over Hydro’s activities to ensure that the public’s best interests are protected.
- They did not want to create another layer of bureaucracy that hampers Hydro’s activities, but need protection so that mistakes are not made again.

7. Move into Competition Cautiously

- No matter what form of competition occurs, Hydro must proceed slowly, ensure consumer input and be closely monitored.
- Consumers must be consulted and educated as changes occur, because ultimately, the consumer will have to pay for any mistakes.

8. Need to Maintain a Role for Ontario Hydro

- Ontario Hydro is perceived as an important resource that people in Ontario feel they have "grown and own". They do not see it in the same light as other crown corporations, but as something that is literally part of their Ontario.
- Meeting the needs of Ontario, its economy and its citizens is the top priority, and this means ensuring that Ontario Hydro is competitive; ie., run in a business-like fashion, and supported.
- Some suggested that limits should be placed on how much energy can be imported.

9. Be Clear on What Restructuring is Trying to Achieve

- In the 90s, businesses in all sectors of the economy are being forced to find new and different ways to conduct business in order to survive. Panel members did not feel that Hydro had truly taken a strategic and creative look at its business segments to see how and where it could improve.

- Rather than taking a piecemeal approach, Hydro in consultation with others, needs to take the time to define its core principles and values before it moves forward.
- Customer benefits from restructuring should be clearly identified.

10. Learn from the Experiences of Competition in Other Sectors

- Consumers felt there were good analogies for Hydro and the province to learn from.
- Deregulation of the long distance telecom market (US and Canada) was not seen as a clear win-win situation. It forced Bell to become consumer focused and lower its rates, but price savings in long distance were eaten away by increases in local service charges, and reliability/convenience was sometimes affected.
- Budget cuts in health care have led many facilities to become more creative and are now profitable.

IV PROPOSED "TWO-PATH" RETAIL ACCESS STRUCTURE

A. SUMMARY OF THE PROPOSED "TWO-PATH" STRUCTURE

1. Establish a Spot Market for Electricity
2. Establish a Central Market Operator (CMO) to run the market and the physical system in a way that ensures reliable service to customers.
3. Give customers direct retail access to suppliers of electricity (Direct Retail Access Path) through the spot market and through bilateral contracts.
4. Establish a single province-wide Price Averaging Pool (PAP) with membership open
5. Rationalize Ontario's transmission and distribution system for efficiency by establishing a single wires company (Wiresco) which would combine the assets of the current municipal electric utilities, Hydro's transmission grid, and Ontario Hydro's retail utilities, with shared ownership by all contributors.
6. Establish a regulatory structure that supports competition. Regulate the wires tariffs for efficiency through incentive regulation, and

to all customers which would provide them with averaged prices for electricity (Price Averaging Pool Path).

INDUSTRY RESTRUCTURING

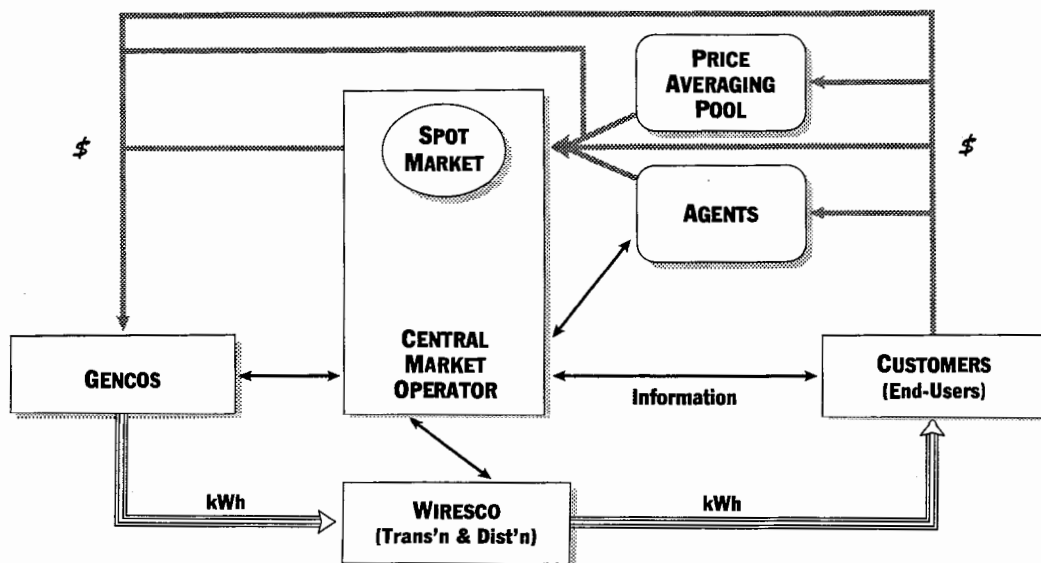


FIGURE K

ensure a fair and level playing field for buyers and sellers of electricity through equitable rules of market access and operation.

7. Privatize or transfer to separate public ownership components of the electricity system where it will enhance competition and/or efficiency.
8. Establish an Ontario Hydro Multi-business Holding Company as part of the transition to open competition.

B. ROLE OF MARKET PARTICIPANTS IN THE PROPOSED STRUCTURE

CENTRAL MARKET OPERATOR (CMO)

- responsible for the integrated operations of the spot market and the power system
- responsible for managing integrated system security, including taking corrective action during emergencies and satisfying obligations as a member of the interconnected network
- receives bids for electricity into the spot market
- integrates the bids with other scheduled deliveries (such as bilateral contracts)
- schedules and dispatches electricity supplies
- directs the operation of the integrated transmission system
- determines and posts market prices

- provides financial settlements between buyers and sellers

GENCOS (GENERATORS)

- all are free to contract with the Price Averaging Pool, retail customers, or agents/brokers acting on behalf of retail customers or out-of-province customers
- can offer (bid) their output into the Spot Market from which the Price Averaging Pool, end users and/or agents acting on behalf of end-users can buy
- all suppliers are free to participate in the marketplace and inject power into the delivery system provided they meet and adhere to stipulated conditions

WIRESO

- comprises the entire publicly owned delivery system (high voltage provincial transmission and the local low voltage delivery facilities), plus interconnections with neighbouring provinces/states, and all common transforming facilities and equipment
- responsible for the planning, acquisition, maintenance and directed operation of all delivery (transmission and distribution) facilities
- responsible for upgrades, capital additions, or changes to delivery facilities based on foreseen needs of suppliers and customers
- operates as a common carrier

- determines the transmission and distribution tariffs (subject to regulation)
- determines standards for connection

PRICE AVERAGING POOL (PAP)

- a single not-for-profit aggregator which purchases electricity on behalf of its member customers in competition with other agents
- resells electricity to its member customers "at cost", either on an averaged or real-time basis
- has obligation to purchase electricity for any customer who wishes to join the PAP
- the principles of its operations are overseen by the government or the regulator
- manages market risks for the benefit of its customers through longer-term electricity contracts with suppliers
- its operations are funded by its member customers

AGENTS (AGGREGATORS, BROKERS AND MARKETERS)

- marketers act on behalf of any generator(s) to market power to the Price Averaging Pool, customers or to the spot market (subject to specific requirements)
- aggregators, and brokers act as purchasing agents for end-use customers

- licensed to ensure consumer protection and the integrity of the marketplace

ENERGY SERVICE COMPANIES

- energy services (e.g., energy audits, DSM, billing, metering) can be offered to customers on competitive basis by:
 - energy service companies
 - the PAP
 - utilities based inside or outside of Ontario
 - agents, brokers, or marketers

CUSTOMERS

- includes all retail customers within Ontario
- have two paths to purchasing electricity:

1st Path

- can contract with generators
- can buy electricity and services from an agent
- can buy direct from spot market (with appropriate metering)
- can bid demand into the spot market

2nd Path

- can join and buy from the Price Averaging Pool

C. TRANSITION STEPS (1996-2000) TOWARD ACHIEVING OPEN RETAIL COMPETITION IN 2000

Industrial, regulatory, and financial restructuring should be implemented smoothly and efficiently. The final stage in the evolution from monopoly to competition is the opening of the electricity market to any and all customers in the Province. Many steps and pieces of the structure have to be put in place by that time, including a broad understanding by electricity consumers of what choices they have and how they go about making them.

Hydro recognizes that ongoing industry, stakeholder, and consumer education and involvement are vital to making the transition to an electricity market an effective one. In addition, there are other specific initiatives needed to put the components in place in order to have the market ready for the year 2000. Included are the following:

1. The internal restructuring of Ontario Hydro into a Multi-business Holding Company to facilitate further segregation and/or ownership transfers as part of the overall unbundling of the integrated monopoly.

This would ready the Central Market Operator to become an independent Crown, and the PAP to be established as a separate not-for-profit entity. Ontario Hydro Distribution and Transmission functions would be combined in readiness for the creation of a single Wiresco across the Province. Generation reconfigured into one, or two, or more Gencos with Nuclear kept intact in readiness for privatization. Ontario Hydro International Inc. and Ontario Hydro

Technologies would also be readied for the introduction of private equity.

In order to implement all of the changes necessary to have direct open retail access in 2000, Ontario Hydro would be given the kind of commercial rights that corporations enjoy under the Ontario Business Corporation Act and pricing flexibility to retain customers in Ontario. A price cap on electricity rates would be part of the transition.

2. The next stage would see the beginnings of external restructuring. The now unified Ontario Hydro wires components would be merged through legislation with the wires operated by the municipal electric utilities.

Rules for the operation of the electricity market and the CMO would be defined, as would the principles of operation for the Price Averaging Pool.

Licensing rules for agents would be drafted.

Besides the rules for operation of the spot market, the overall rules for the regulation of competition would be written. These should include the transition provisions, such as mechanisms for recovering stranded costs.

The newly configured Genco(s) could be privatized once the rules and schedule for open access are defined.

With the writing of new legislation, the CMO would be established under separate public ownership from Hydro, and the PAP formalized.

V COMPETITION UNDER THE PROPOSED RETAIL ACCESS STRUCTURE

A. THE ELECTRICITY MARKET

i) RATIONALE FOR AN ELECTRICITY MARKET AND RETAIL ACCESS

This section identifies some key issues surrounding competition in electricity, and elaborates on why the components introduced in the proposal are necessary and how the rules will govern them.

Retail Access is the Most Appropriate Form of Competition

The thinking behind the "Two Path Retail Access" structure was to identify where the forces of competition, technological change and convergence, and customer choice might most

logically flow, and to allow a structure that would support rather than inhibit their commercial dynamic.

Competition and customer choice dictated that decision-making be put into the hands of the end-use electricity consumers. Customer choice has to mean choice of supplier as well as choice of rates, products and services, for unless there are new entrants and alternative suppliers, innovation and creativity on the service front would not be fully tapped.

The development of markets for electricity services, and the associated marketing potential for convergence at the retail interface would be

MAJOR RETAIL ACCESS INITIATIVES/PROPOSALS

<u>JURISDICTION/UTILITY</u>	<u>DATE OF INITIATIVE/PROPOSAL</u>
United Kingdom	1989
Norway	1991
Victoria (Australia)	1994
California	1994
Wisconsin	1995
Illinois Power	1995
New England Electric System	1995
New York Power Authority	1995
American Electric Power	1995
New Hampshire Public Utility Commission	1995
Massachusetts Utilities	1995
Rhode Island Utilities	1995

FIGURE L

severely inhibited if only resellers had choice. The end-users would not be the choosers.

In fact, the natural birth of a market starts with the retail customer. As Commissioner Jessie Knight points out in his California PUC recommendation, "Most industries start with retail competition, transactions between individuals. Over time, as people trade with one another, they realize that there may be economies of scale that they can realize by purchasing in bulk. Hence a wholesale market develops. While competition in the wholesale market is vital to lowering wholesale prices, still greater benefits can be created for retail consumers through retail competition."

Why Simultaneous Access by All Customers?

Some jurisdictions are introducing retail access to electricity suppliers in phases, first to large industrial users, then to smaller businesses, and finally to residential customers. Our view is that giving some customers access rights ahead of others would not be acceptable to most customers because it would violate long-embedded Ontario values about equity. Natural gas access was introduced in Ontario to all users without discrimination.

Furthermore, a phase-in would allow large users a preferential opportunity to tie up the most attractive supplies. We believe that the legitimate needs of large users could be met in the interim through flexible pricing which offers competitive rates within the framework of the commitment to no overall rate increases for the 1996-2000 period.

Ontario requires a structure that can best support potential developments in convergence. It would be imprudent to set sights on an industry structure that is likely to be superseded through technological change.

The future structure of the electricity industry must be cognizant of the fact that most customers are not really interested in buying electricity. They want a service (such as heat, lighting, or motive power). Increasingly, the most efficient and cost-effective way of providing such services may involve a variety of energy sources (electricity, natural gas, other fuels) and energy efficiency measures. Improvements in fuel cells, storage batteries and flywheels, and renewable technologies could open up more home utility generation possibilities. With the eventual growth and convergence in the supply of energy and its services, only retail access makes sense.

ii) CHARACTERISTICS OF ELECTRICITY SYSTEMS

In creating a market mechanism for electricity, it is critical to understand how the physical flow of electrons can be integrated with financial transactions. Electricity has its own distinguishing characteristics to which market concepts such as customer choice, access by suppliers to markets, and changing availability of supply and customer demands need to be adapted.

In the simplest terms, an electricity system is composed of three components: electricity-producing generators; a delivery system of high and low voltage wires; and electricity-consuming devices, operated by customers. Electricity cannot be stored in the volumes that other

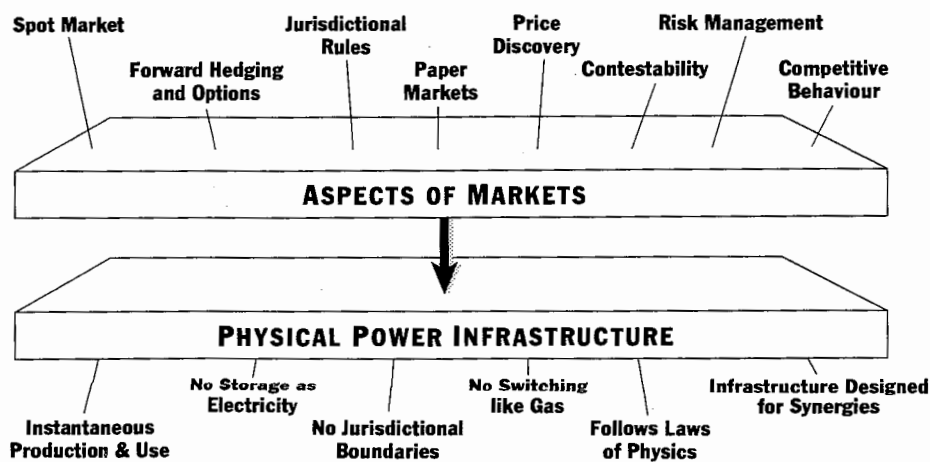
commodities can. It must be produced at the same instant and in the same quantity that it is consumed. Thus, there is a need for a continuous physical connection between the generators, the wires and consumers.

For reasons of both reliability and economy, the electricity system in North America has evolved into an extremely large and highly integrated transmission grid connecting all suppliers and consumers. The electricity injected to this grid is homogeneous; electricity at any point is indistinguishable from any other. Electricity flows freely on the grid over multiple paths according to the laws of physics, not commerce. Electricity cannot practically be directed or switched like other commodities such as gas.

The flow is effectively controlled by the quantity and location of electricity injected into and leaving the system. The physical integration and speed of delivery also means that any abnormal event anywhere on the system has an effect on all parts of the system. An extensive set of criteria, rules and agreements have been developed by utilities throughout North America to govern the coordinated operation and planning of this integrated electricity system.

This has resulted in the construction of a multiple path transmission grid, complex monitoring and control devices, and the need for instantaneously available backup generation held in reserve. This complex network is managed through sophisticated system operating centres

INTRODUCING ELECTRICITY TO MARKETS: PHYSICS MEETS COMMERCE



"More a Phenomenon than a Commodity"

FIGURE M

that dispatch the generation to match the varying electrical demand. The centres in each electrical area exchange information to ensure effective coordinated actions. One of the key features that has developed in this integrated system is that of coordinating generators such that the generators with lowest incremental costs are used first, resulting in the most efficient use of available resources.

Historically the utilities that have developed and operated the electricity system have been fully integrated utilities owning generation, transmission and distribution. Consequently the systems have been developed to be operated in an integrated fashion; that is, the transmission system was built to accommodate the running of generation in a particular manner. Generators of different operational and cost characteristics have been built to be complementary to each other.

Nevertheless, there are limitations or congestion on transmission grids which can prevent the most economical generators from being used. These conditions vary with the changing patterns of generation, consumption and even the weather.

iii) CREATING COMPETITION IN A RESTRUCTURED INDUSTRY

Reliability of Supply

Electricity demand changes substantially and sometimes quickly throughout the day and at varying rates at different locations. All changes in supply and demand affect all others and interact with the transmission network in complex ways. For many generating equipment

failures there is no time to react; the system must be designed, planned and operated in anticipation of these contingencies, and this has an impact on which generators are selected to inject power into the system. Time constraints for other operating decisions are very short, requiring continuous and careful monitoring of operating conditions and management within well established rules. Restoring the system in the event of a blackout requires a piece-by-piece reconstruction of disaggregated pieces into a coordinated whole, maintaining the balance of generation and load at all times.

Electricity users will take power as they need it. Allowing generators or transmission operators to operate their facilities independently without coordination can never satisfy the balancing needs of a dynamic electricity system. Even if generation and transmission are dispatched to prearranged contracts, the variations from what is contracted and planned need to be coordinated.

It is generally accepted that a single coordinator is required to manage the complexities of an integrated power system. Even in a competitive structure, a single system operator must be granted the authority to manage the dispatch of generation and transmission facilities for the purpose of instantaneously matching supply and demand and ensuring the integrity of the interconnected system. The operator must have access to all information that can influence the operating decisions.

An important distinction in moving from a monopoly to a market system is that, in the past,

dispatch decisions were made on the basis of lowest incremental cost, whereas in the future these decisions will be made on the basis of prices bid by the market participants.

As the decisions made by the system operator could have economic consequences for the market participants there should be no ownership affiliation of the market operator with any participant. The operator should simply be a service provider to the marketplace.

Efficient Market Operation

Unlike many other commodities, different electricity generators have significantly different incremental costs of producing electricity, primarily related to the variable costs of different fuels and the efficiency of converting that fuel to electricity. There can be advantages to all market participants if the generators with lowest incremental costs are used before those with higher costs. This has been recognized and used for years by utilities as the basis for an economic dispatch that provides the least-cost means of matching the hour by hour supply and demand.

Under a monopoly situation, longer term investments in generation have been made by utilities and regulators on the basis of long-term forecasts of customer needs.

In a competitive marketplace consumers and suppliers are free to choose how and with whom they will transact their business. It is desirable that the existing mechanisms be replaced with new ones that ensure the efficient short-term use of resources, as well as providing a basis for long term investment decisions by the market participants.

A poorly designed market structure cannot assure that the agreements between buyers and sellers will result in both economic efficiency and comparable access.

For example, a market structure could be based solely on point-to-point transmission contracts and bilateral commodity contracts between buyers and sellers. Generation with relatively high running costs could be run under contract while less costly generation (which could run to meet the same demand) stands idle.

Transmission capacity would have to be assigned to meet the needs of the transaction between the seller and buyer. This reserved transmission capacity would likely have to be conservatively estimated to guarantee the ability to honour the firm point-to-point transmission path contract under a wide range of load conditions. Access to available transmission capacity would likely be assigned on a first-come first-served basis. Such a market would have little chance of making most efficient use of available resources for the benefit of all.

There is a much better mechanism for using the system efficiently than individual contracts between buyers and sellers and reserved transmission capacity. A short term spot market through which demands for electricity are met on the basis of hourly price and volume bids by generators provides an efficient mechanism for resource use.

The price for customers, and the payment to generators, is based on the hourly market clearing price; the price of the highest bid used

in the hour to meet the demand. Generators are motivated to bid their incremental costs because bidding lower attracts the risk of being paid below costs while bidding higher runs the risk of not being run and paid at all.

The result is that the best offers available are used to balance the system demands, and all selected offers are paid market value for the service. Efficient pricing information is available to make least cost changes in dispatch due to system constraints. The market clearing price creates a common reference price that makes it easy for buyers and sellers to write financial contracts for differences from the spot price to realize any commercial result they desire.

Generators and consumers who still desire to have firm commodity contracts can operate according to their contract, or opt to use the spot market when this is more efficient.

Transmission Congestion

Constraints on an integrated transmission network are dynamic and complex. The pattern of operation resulting from a lowest bid price dispatch or from bilateral transactions will not always be possible due to these constraints. The actions taken to deal with them are influenced by all other actions on the system at the same time. Any assignment of physical transmission rights that are feasible **all** of the time is likely to under-utilize the capability **most** of the time.

A mechanism is needed that can manage constraints by easily and efficiently determining who can and should consume and produce more or less, and by providing market incentives for

them to do so by compensating for the resulting costs and profits. Mechanisms and models for congestion management have been proposed, including:

- locational price signals – a means whereby the spot market price would be different on each side of a transmission constraint, reflecting the difference in clearing prices resulting from the modified dispatch and
- the allocation and trading of physical transmission rights (with customer value of transmission as a means of allocating transmission rights) or
- payments to the participants which are affected by a constraint – to the lower cost generator which is not operating due to the constraint (the “constrained off” generator) and to the higher cost generator which is now run due to the constraint (the “constrained on” generator); the consequent costs would be added to the spot market price, distinct from the normal transmission tariffs.

Practical applications of these will take time to develop, but as the structure evolves, a preferred approach may emerge. Hydro recognizes that how this issue is dealt with will be a key determinant in ensuring equitable access and compensation to market participants.

iv) ISSUES IN COMPETITION

Equity of Access and Price

Most generators and customers have never been allowed to compete for electricity supply in Ontario. Physical access of generators has been

controlled by Ontario Hydro while access for customers has been provided for all under Hydro's service obligation. The cost of electricity has been averaged in the provincial pool such that all resellers, such as municipal electric utilities and Ontario Hydro Retail, purchase electricity at comparable prices. There is concern that competition will introduce increased disparities that give some suppliers and customers unfair advantage at the expense of others; large customers versus small, urban customers versus rural and remote customers etc.

For an effective competitive market, it is essential that equivalent access be available for all suppliers and customers to both physical connection and to the market. There should not be unfair discrimination due to size or location of market participants.

Equity of physical access should be provided by connection requirement obligations on the monopoly wires provider. Anyone wanting connection would be granted it subject to well defined technical standards. Charges for connection would be reflected in regulator approved direct connection costs and locational network tariffs.

Equity of access for generators to the market is facilitated through a central market. Any generator, large or small, can bid into the spot market or request to be run under terms of their contract arrangement. Payments to generators will be at the clearing price of the market. Deviations from this will only result from separate financial contract agreements between the generator and customers.

Equity of access for customers to the market is also facilitated through the central market either directly or through an agent. However it is possible that many customers will not want to find an agent to represent them. The Price Averaging Pool will ensure that these customers have the same access to the spot price for electricity on either a real time or price averaged basis. Real time price access will be limited to those customers who choose to purchase appropriate metering.

Equal access to the benefits of a competitive market is also assured by offering access to all customers at the same time rather than staging it over time for different sized customers.

Obligation to Serve & Security of Supply

The obligation to serve and security of supply are really two separate issues in the restructured electricity industry.

The obligation to serve refers to the historical obligation of utilities to ensure that customers had access to electricity in the amount they required. Continued access to the electricity network will be ensured by an obligation on the Wiresco (and on wires owned by private utilities) to provide, on a non-discriminatory basis, physical connection and delivery service to all suppliers and customers.

The obligation to provide adequate electrical supply to meet demand, which has been assumed by Hydro in the past, disappears in the restructured industry. However, based on experience in other industries, we believe that market forces will be sufficient to ensure that adequate supply continues to be available.

Security of supply refers to the reliability of the network and its components. The Wiresco will plan, maintain and operate the physical components of the delivery system to ensure their reliability to defined standards of performance. The Central Market Operator will use bids and contract information to manage the network of generators, transmission and customer equipment to preserve its integrity under a variety of conditions and will take directive action during emergencies.

Electricity Planning

In a competitive market, traditional utility planning for supply yields to the provision of electricity supply through market forces. The need for new supply is communicated through market prices and contractual arrangements between buyers and sellers.

Planning of the delivery system, however, is to be undertaken by Wiresco (and also by the privately owned distributing utilities). Delivery facilities are planned on the basis of foreseen needs of suppliers and customers (i.e., market need), system security requirements, and inter-connection requirements.

The Development of Futures Markets in Electricity

In the restructured industry, customers, their agents and generators will be exposed to uncertainty in the price of electricity. While bilateral contracts is one means of managing this uncertainty, it is our expectation that a financial or "paper" market will develop in electricity as has for other commodities, to provide a tradeable mechanism to manage price risk. The develop-

ment of a "paper" market in electricity would consist of a bid and ask futures market in which forward contracts are traded as in the natural gas marketplace and currently proposed by NYMEX for electricity. This market would satisfy the two important roles of price discovery and price transparency through subscribers' access to "real time" price and volume information. An electronic trading system would allow contracting parties to enter into a variety of standardized forward contracts, or futures, for the price of electricity.

Regulatory Issues

There are a number of issues that arise in introducing competition which will require regulatory mechanisms or regulatory oversight over market rules. Hydro's response to those issues are contained in Chapter VI on legislative and regulatory changes. Among such issues are the following:

Self Dealing

Having competitive generation traded and dispatched through a market and system operator and a sometimes-constrained monopoly transmission provider who are all under common ownership, would create opportunity and incentive to unfairly influence the market to the disadvantage of other market participants.

Market Power

Ontario Hydro currently owns over 90% of the generation used to meet the market demand in Ontario. The concern is that this dominant market position creates the potential to influence the market to the disadvantage of customers or other competitors.

B. INTRODUCING COMPETITION INTO THE GENERATION SECTOR

i) CURRENT GENERATING SOURCES

TYPE	CAPACITY (MW)*	ENERGY (TWh/A)
Ontario Hydro Hydroelectric Business Unit	7,100	36
Ontario Hydro Nuclear	13,500	80 - 95
Ontario Hydro Fossil Business Unit	8,700	10 - 15
Purchase Non-Utility Generation Contracts with Ontario Hydro	1,500	10
Customer Generation and Other Utility Generation	~ 1,500	~ 6
Interconnections to Neighbouring Jurisdictions	- 2,500 to 4,000	up to 20 in or out

* Currently in-service or committed under contract.

Ontario Hydro's generation makes up a substantial fraction of the province's total generation supply; a little over 90% based on energy production. As a result there are questions about how competition can take place with such a large market player. Several industry observers, analysts and customer groups advocate that at least three to five generation companies need to exist in order to achieve effective competition in generation supply. However, before dividing Ontario Hydro generation into separate entities there are several factors that need to be considered, which are discussed below.

ii) GENERATORS AND THE MARKET

Open access provides choice and competition which are the key drivers of market discipline.

It is the market structure and rules that create

the opportunities for customer choice and competition. With open access, consumers will be able to 'vote' with their purchasing dollars for the products and services they value and for the supplier of those products and services. If there is unsatisfied demand for certain products and services in an open market, a supplier should step in to meet the demand and gain that market share. Customer choice and competition will be more significant than the number of competing suppliers.

Technology is also an enabler of competition; distributed generators, such as customized gas-fired units, will become more pervasive players in the competitive environment.

Market areas, market rules, and players in an open North American market will determine prices.

In an open northeastern North American market area, the configuration of generation within Ontario would have secondary impacts on prices compared with the impacts of the market rules and the degree of symmetry of rules between market areas and other market players.

**Competition takes place on the margin.
Base load and 'must run' suppliers do not set prices.**

Competition to Ontario Hydro's generation currently takes place with customers who self-generate and with utilities on the other side of the interconnections in neighbouring jurisdictions. The existing Ontario non-utility generators are generally recognized as 'must run' suppliers to Ontario Hydro, but most would be competitors in an open market.

For the most part, the base load generators will be 'price takers'; that is, they will run and take whatever the market price happens to be (subject to bilateral contracts). The price will be determined by the 'price setters' – the generation that runs on the margin. Competition to supply the market will essentially be limited to, and most intense among, the price-setting marginal generators. Even in an Ontario-only market area, the utilities on the other side of the interconnections can be the price setter, not Ontario generation entities. This is because of the number and size of generation configurations in the nearby U.S. market area and because this larger market area also has surplus generating capacity. The interconnections can provide price discipline in an Ontario market.

iii) RECONFIGURING ONTARIO HYDRO'S GENERATION

Benefits of integrating within and among technologies provide effective cost efficiencies.

Operational efficiencies and technical synergies currently exist among the generation technologies because the existing Ontario Hydro generating mix was designed to be complementary. Many of the operational integration benefits would be diminished or lost if the technology groupings themselves were divided; benefits in areas such as: fuel acquisition, operating reserve; water regulation and management; maintenance scheduling, and delivery.

Ontario Hydro Nuclear (OHN) should be maintained as a single entity.

Maintaining a single nuclear entity:

- is consistent with a comparison of the best performing nuclear stations in the world, based on cost, safety and operational performance, which shows advantages of size, i.e., ownership of several stations, particularly multi-unit stations;
- provides focused support for the human resource and physical assets through a board of directors and senior management team committed to excellence in safety and performance; and
- permits a merger of OHN and those parts of Atomic Energy of Canada Ltd. that directly support CANDU technology. Such an entity would provide economic benefits for Ontario and Canada through the improved capability to grow the CANDU business in international markets.

GENCO CONFIGURATION DEPENDS ON OBJECTIVES

OBJECTIVE	CONFIGURATION
• Maximum market value	• Single integrated Genco
• Maximum synergistic benefits	• Few large Gencos, maintaining fuel integration
• Maximum intra-Ontario competition	• Many smaller Gencos
• Maximum customer choice	• Many smaller Gencos, some fuel specific
• Maximum competitive position	• Large Gencos
• Good market value	• Single nuclear Genco
• Some synergistic benefits	• One or two blended hydroelectric and fossil Gencos
• Some intra-Ontario competition	
• Increased customer choice	
• Good N.A. competitive position	

FIGURE N

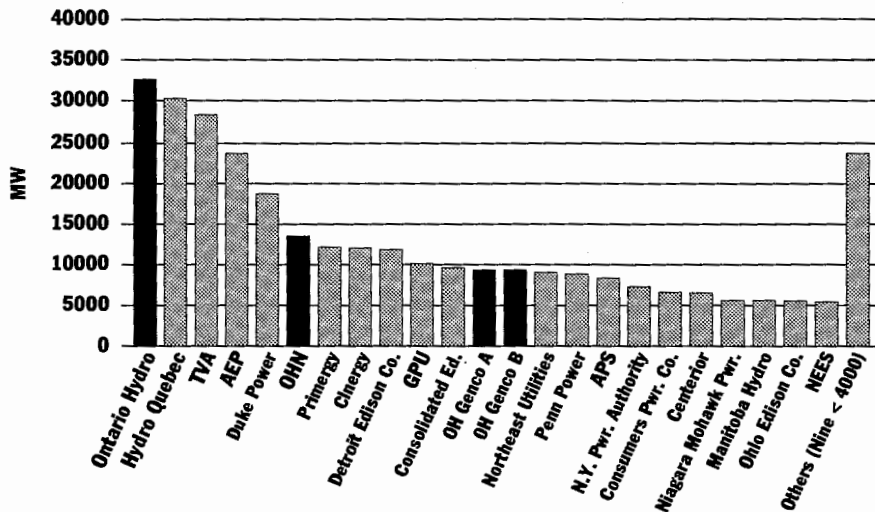
If generation is to be divested, the entities should be sized for the market area.

General objectives for reconfiguring generation in Ontario, consistent with the larger industry restructuring objectives, include: improving operating efficiency, improving competitive position, maximizing market value (if assets are put up for sale), increasing customer choice, improving competition, and providing flexibility. No single configuration best meets all objectives. However, configurations with larger entities perform well against most of these objectives, particularly those of increasing market value, maintaining operating efficiency and improving competitive position.

This general finding is corroborated in part by the recent mergers and acquisitions among US utilities as they prepare for open access and competition. It is also generally supported by other utility analyses and data, although exceptions to performance based on size do exist. The main offsets to having larger utilities are that beyond a certain size, management control is reduced, which can create both cost inefficiencies and greater potential for abuse of market power.

No matter what the generation configuration starting point is, capital investment and the market and market rules will reshape the generation entities.

GENERATION CAPACITY IN ONTARIO HYDRO'S MARKET AREA 1994



Ontario Hydro generation shown integrated and split-up.

FIGURE O

Generation entities will change as competition for market share evolves and influences the portfolio of generation an owner can most profitably utilize. The interconnections, the markets and the market power that exists in neighbouring jurisdictions will influence competition in Ontario. Depending on the market rules, the interconnections allow generators, aggregators, marketers and brokers outside Ontario to compete for market share within Ontario; and they allow Ontario generators, aggregators, marketers and brokers to compete for market share in other jurisdictions. Furthermore, there will be open competition in capital investment to meet load growth, rehabilitate existing facilities or to replace generation that is retired from service.

What is the best generation configuration?

No one configuration best meets all industry restructuring objectives (see Figure N). If Ontario Nuclear is established as one entity, then one or more entities can be created from the Hydroelectric and Fossil business units, depending on the extent of the open and competing market area (ie., Ontario and the northern U.S.), perceptions of the quality of competition with the number of competing entities, and trade-offs made among objectives.

Figure O shows all Ontario Hydro generation integrated, as well as Ontario Hydro Nuclear and two equally-sized Gencos (hydroelectric and fossil).

C. INTRODUCING COMPETITION IN ONTARIO'S RETAIL ELECTRICITY SECTOR

i) THE CURRENT STRUCTURE

Ontario's retail electricity sector reflects its evolution, whereby every municipality had a right, if it so wished, to create a municipal utility which would have sales franchise in its area and access to wholesale power at a provincially pooled price. Under restructuring, that would disappear.

Ontario's publicly-owned distribution sector now consists of 306 Municipal Electric Utilities (MEUs) and Ontario Hydro Retail (OHR). There are also several relatively small, private utilities, such as Great Lakes Power. Almost all

customers of the MEUs and OHR take power from the low voltage distribution network, but there are some very large industrial customers which take power directly from the high voltage transmission network.

MEUs serve the majority of customers – in the urban areas, which cover only a small fraction of the geographical area of the Province. They are overseen by a board of commissioners, which is either elected or appointed by the municipality. Under current legislation, MEUs retain strict financial independence from their municipalities, which have no access to MEU revenues or proceeds from the sales of any MEU assets. As part of a publicly-owned business network with its own books, the MEUs are regulated by Ontario Hydro.¹ Both the

ONTARIO'S PUBLICLY-OWNED DISTRIBUTION SYSTEM: MAJOR CHARACTERISTICS

	MEUs	OH RETAIL	COMBINED
Number of Utilities	~306	13	N/A
Customers:			
• Total	2.85 million	0.95 million	3.8 million
• Per Utility	~130 to 220,000	73,000 average	
Energy Sales:			
• Total (TWh)	89	18	107
Revenues	\$6.8 billion	\$1.8 billion*	
Customers per km of Line	50 to 90	18 average	
Distribution Costs: (excl. very large customers)			
• OM&A per Customer	\$189	\$172	
Net Income			
• Total	\$324 million	\$95 million	

* Includes Rural Rate Assistance

FIGURE P

municipal utilities and OHR pay wholesale power costs which depend only on the voltage at which they take supply and are independent of geographic location – in essence, making them part of the current provincial, price-averaging wholesale power pool. Nevertheless, the rates currently charged by MEUs vary across the Province, by over 40% for residential customers and by over 50% for commercial customers.

Ontario Hydro Retail serves all customers not served by MEUs, including customers located in the roughly 500 municipalities that have not chosen to create their own electric utility. OHR's system covers most of the Province, serving areas ranging from high-density urban to low-density rural. The costs of delivering power to customers in rural areas of lower population density are generally much higher than the costs of serving urban customers. As a result, some of OHR's year-round residential customers in rural areas receive a legislated cross-subsidy in the form of Rural Rate Assistance (RRA) which ensures that average 1,000 kWh bills for OHR's year-round residential customers are within 15% of the weighted average MEU bill for such customers. The costs of RRA are recovered through the costs of power to all customers, including OHR customers.

The dominant fraction of the power bill paid by consumers, typically 70% to 90%, is due to the wholesale cost of power (which includes the cost of generation and transmission). Distribution costs (including distributors' net income, OM&A, interest and depreciation) add the remaining 10% to 30%. OHR's capital costs per customer are significantly higher than those of

the municipal utilities because of the costs of extending lines to rural customers, but its OM&A costs per customer are lower than the MEU average.

ii) THE PROPOSAL FOR A COMPETITIVE RETAIL ELECTRICITY SECTOR

The Two Components of the Retail Function

Our proposal for restructuring the retail electricity sector is based on the recognition that retail distribution of electricity consists of two distinct functions:

- the sales of electricity and related services to the consumer and,
- the delivery of electricity to the consumer via the physical infrastructure (the wires).

Competition can and should occur in the provision of retail electricity sales and energy services. However, it is generally accepted that the function of electricity delivery must remain, to a large extent, a natural monopoly. These precepts are being followed with the introduction of competition and customer choice in electricity in other jurisdictions such as the UK and Australia.

The Rationale for Creating a Single New "Wiresco"

The function of electricity transmission and distribution through the wires remains to a large extent a natural monopoly. However, the current structure, with over 300 distribution systems represents a substantial barrier to efficiency and effective competition in retail electricity sales.

Before introducing competition in the electricity industry, there would be substantial benefits to Ontario if the Government rationalized the non-competitive monopoly wires components for greater effectiveness and efficiency.

We propose that Government create a completely new "Wiresco" company to serve the new market as a single regulated common carrier. Its assets would comprise the current publicly owned transmission and distribution systems. This new wires company would be a share-capital structured company, owned by those who have contributed its assets. This ownership structure would not preclude privatization at some later date.

This entity would not have a competitive function, and its formulation should therefore be dictated solely on the basis of securing the most efficient structure. Hydro estimates that a rationalized wires infrastructure could, through eliminating duplication and achieving better economies of scope and scale, produce annual savings in excess of \$200 million. A form of regulation which includes a productivity component should induce on-going operational efficiency improvements on top of a newly formed structure that is better able to deliver them.

There are privately owned electrical utilities in the Province which hold wires assets. They would be required to unbundle the wires part of their business from the competitive ones, and make them available as part of a province-wide regulated common carrier.

The new "Wiresco" could be organized into various operating units: for example, a single entity which operates those parts of the high-voltage grid that need a high degree of centralized coordination, and a small number (five, or so) of regional low-voltage distribution entities incorporating the systems currently operated by the Municipal Electric Utilities, Ontario Hydro Retail and some parts of the Ontario Hydro Grid. A single new Wiresco entity would have the benefits of:

- providing, from the customer's perspective, a single accountability for connection to the network, reliability, power quality, and pricing of delivery (as Wiresco customers include both end users and generators),
- facilitating competition in energy sales by providing simplified and equitable access to delivery services through a Province-wide common carrier,
- improving efficiency by improving system coordination, creating economies of scale, and reducing duplication and overlap, and
- facilitating convergence among the electricity wires, communications wires (telephone and cable television, etc.), and other fixed link delivery channels such as pipelines. The Wiresco's telecommunications assets alone would have great potential business benefits relative to the current system.

Decisions on investments in major new Wiresco infrastructure would be made with the

involvement of the market participants and the regulator in response to market requirements.

As well as introducing competition for customers, the new structure should also promote competition for work. For example, while the infrastructure and ownership of the wires themselves are monopoly by nature, there is no reason why activities such as line maintenance, line extensions, and new construction could not be supplied on a competitive basis. This is an area where the owner of the wires could have discretion to provide these services in as efficient a manner as possible, and as required under the incentive regulation targets.

In the September 30th paper, we suggested that economic forces would drive system rationalization in a competitive market. However, it is now believed that it would be more efficient if the Government created an improved configuration of the publicly-owned delivery infrastructure. This action is now believed to be necessary to realize early benefits for all customers.

How the Competitive Market Would Operate

Under open retail competition, any customer within the Province would be free to purchase from the spot market or contract with any licensed seller of electricity (e.g. Gencos, and agents such as aggregators, brokers, marketers or the Price Averaging Pool - PAP). The customer would also be able to contract with any provider of energy services, as is the case now. The competitive market in electricity

sales and services will be as simple or sophisticated as a customer desires. (see Figure Q).

The detailed operation of the retail market will depend on the design of the trading arrangements, particularly the components of pricing and metering or other means of customer account reconciliation; however, the following broad principles can be established.

Basic Pricing

The basic price paid by all consumers would include two major components: a tariff for delivery (paid to the Wiresco), and a payment for energy consumed (paid to the agent from whom the customer buys electricity). These, plus additional prices for discretionary energy services, could be charged separately or as part of a service package based on customer preferences and the service options provided. The Wiresco tariff would be regulated; the prices for energy and other services would be set by the competitive market.

The Wiresco tariff could be in the form of a fixed monthly service charge paid by all consumers connected to the system. The amount of the charge would be cost-based, reflecting factors such as peak demand, location and customer density. Tariffs and system connection charges should be non-discriminatory in the sense that similar classes of customers (e.g. with similar usage patterns, density, etc.) should pay similar rates. Special equipment or services provided by the Wiresco (such as power quality corrections) would be charged separately. It remains to be determined whether, for customers of retail agents (such as the PAP or brokers), the Wiresco

OPTIONS FOR CONSUMERS IN THE YEAR 2000

PRODUCTS AND SERVICES PROVIDED:	PLAYERS					
	PRICE AVERAGING POOL	AGENTS	ESCOS	CENTRAL MARKET OPERATOR	GENCOS	WIRESKO
Electricity						
• Spot Markets	✓	✓		✓		
• Contract purchases	✓	✓			✓	
Delivery	✓	✓				✓
Metering	✓	✓	✓			
Billing	✓	✓				
Technical Services	✓	✓	✓			
Energy Management Services	✓	✓	✓			
Financing/Risk Management	✓	✓				
Distributed Generation	✓		✓		✓	✓

FIGURE Q

Customers desiring simplicity they enjoy today could, by choice or by doing nothing, join the Price Averaging Pool. The PAP could look after purchasing electricity, paying delivery tariffs, and arranging energy services for customers. Customers could be billed a single bundled price as they are today.

Customers desiring a more sophisticated arrangement could purchase some electricity themselves at a contracted price with a generator, and some at a spot market price. They could manage price risks through the electricity futures market, and contract for energy services through an agent.

They could be billed for each of these separately or together as they wish. These customers would have used the newly available market mechanisms to customize their electricity service to meet their specific needs.

A summary of some of the options available to customers is shown in Figure Q.

In many respects, the choices being proposed for electricity customers in Ontario is what telephone customers already have. While customers in Oshawa have to use Bell for local calls, they can choose to contract with Sprint, Bell, Unitel, or others for long distance services linked to them through their local Bell network.

would bill the agent or the customer directly. Customers may be given a choice on this.

Delivery costs for regions of lower population density or locations remote from the Grid are much higher than those in densely populated regions. Wiresco tariffs for rural and remote areas of the Province could be subsidized to ensure that the overall bills that customers in these areas pay are within a reasonable range of bills in other areas (much as is currently done under Rural Rate Assistance). Some degree of regional variation should be retained, however, to ensure that price signals encourage the economic location of generation. This approach of separating the regulated Wiresco tariff from the competitive energy price – and, if necessary, eliminating any unacceptable geographic variations in the Wiresco tariff via subsidies – likely would lead to a smaller variation across the Province in the bills paid by customers than currently exists.

Unlike the Wiresco tariff, there is no substantive reason for the energy price to vary greatly across the Province (in the absence of major transmission constraints). There is some impact of energy losses incurred in transmission and distribution – which are higher for rural and remote areas because of the longer distances involved – but the overall bill impact due to such differences amounts to only a few percent.

A wide range of price and supply contract options will likely develop over time. Due to the impracticalities of providing advanced, real-time metering to all customers in the short term – initially most customers will have access to

competitive energy supply at time-averaged prices (over the duration between meter readings, or longer). Customers with appropriate metering will pay higher metering costs but will have access to the real-time spot price almost immediately and pay somewhat lower prices.

PAP Pricing

PAP members could buy electricity at prices set by the market clearing price, either on an time-average or spot basis, or at prices negotiated between the PAP and generators. Their PAP bill would include both the energy charge and the Wiresco tariff. Discretionary services provided by the PAP such as energy management and beyond-the-meter services would be priced competitively with those of other aggregators, brokers, marketers, or ESCO's. The costing and pricing of the regulated and discretionary functions must be separate, perhaps according to cost allocation rules set by the oversight agency.

Metering

The Wiresco should assume ownership of the existing metering stock at the time of restructuring and, at least initially, be obliged to provide metering services for all agents and customers based on a standard set of charges set by regulation. Ultimately, metering services could be supplied by any licensed entity. Metering and billing costs would be recovered either as part of the regulated Wiresco tariff or as a separate competitive charge, depending on who provides the service.

In an open market, the information management infrastructure and processes, including metering, will become much more complicated because of the vastly increased number of interactions that

are possible among players in the market and end-use customers. Even so, there is no fundamental technical barrier to giving all customers access to competitive supply on a time-averaged pricing basis without any change in the currently installed metering.

For a period of time, technology and infrastructure constraints will mean that not all customers will have access to **all** supply options. Direct access to spot prices, for example, requires sophisticated metering, two-way communication, and information handling technology which, although available now, is cost-justified only for large customers. In a few years, it is anticipated that technological development will make it practicable to make advanced metering attractive to all customers, which would provide significant further benefits such as allowing home appliance and energy use to be automated in order for the customer to take advantage of periods of low prices. In fact, it is expected that the introduction of retail competition will drive technology development in home and office in metering and control systems.

For customers who remain metered on a time-averaged basis, there will remain the issue that there is no way of knowing how much energy a customer consumes when spot market prices are low or high. This results in uncertainty in the amount of purchased energy attributable at any one time to a given agent, and therefore to the associated cost of energy to be charged to that agent. Potential solutions to this problem include defining typical load profiles (e.g. hour-by-hour patterns of energy use) for various classes of small customers, with the expectation

that aggregating demand over a large enough number of these customers will allow costs of power for the agent to be defined with sufficient accuracy. The agent would then need to manage the risks arising from remaining uncertainties.

Competition in Energy Services

The evolution of energy services under competition must also involve structural change.

The major competitive thrust in retail services will be in those areas involved in the interface with the end-use customer. As the electricity industry restructures, many existing and new players are moving into a broader "portfolio management" function, offering integrated energy and other services packages, rather than basic electricity sales, as the centrepiece of their business and marketing strategies. These service packages comprise innovative combinations of energy and associated services, such as integrated dual fuel and other energy utilization services, technical services and financing, as well as energy efficiency components, increasingly using local demand-shaping sources such as storage and on-site generation.

These packages would be enhanced further by the carriage of consolidated telecommunications services (data, voice and image), which could be provided by the Wiresco. Overall, the dominant companies will be those which master the capability to provide "mass customization" of those kinds of packages.

In the monopoly world, integrated utilities have offered customers some of such services as part of their total service. Many were undertaken as part of an integrated resource planning effort.

Ontario Hydro was no exception and has, like many other integrated utilities, built up some expertise and experience in many aspects of energy service to the customer, as have some MEUs.

Potential Energy Services Providers and their Roles

Under restructuring, a natural question is, "Who provides downstream energy services to the customer?" The short answer in a competitive world is, "Anyone who can succeed in selling them to electricity customers." Under competition, there is no reason why any energy service company, utility, or any aggregator, broker or marketer in combination with others, could not do so, provided that they meet certain technical standards and the expectations of fair competition. Some of these may be successor companies to the current Ontario Hydro or MEUs; others may be relative newcomers. The roles of the various participants as potential providers of energy services are discussed below.

The Price Averaging Pool

The initial likely delivery point for much of this expertise would be the Price Averaging Pool. Many, if not most, customers who decide to become members of the Price Averaging Pool would expect to be able to buy electricity and associated energy services in a simple, bundled, one-stop shopping mode.

For its member customers, the PAP would be entitled to compete to sell energy services, but would have no exclusive right to do so over any other service provider. In addition, some customers who have historically dealt with

Ontario Hydro in meeting their energy service needs, might expect to be able to purchase those services at their discretion without having that right tied to an obligation to also purchase their electricity from the PAP.

The Generating Companies

There is no reason why generators should be excluded from offering energy services to customers, especially if, as Hydro suggests, distributed generation becomes an increasingly important part of local on-site energy networks.

The Wiresco

Whether the Wiresco would offer such services is more problematic. Distributed generation could provide a way of better utilizing the wires, but could also provide competitive pressure on Wiresco's service tariffs. Services involving convergence with other industries are a possible business opportunity for the integrated wires network.

Yet there are issues around Wiresco involvement in these areas, primarily because the Wiresco is set up as a regulated common carrier to serve the market. It may make strategic sense for the Wiresco to be involved in the extension of the services associated with the wires into the customer interface and past the meter, but such involvement should be on the basis of providing common carrier service to all.

NEW COMBINATIONS OF PARTICIPANTS

Besides customization, integration of other service benefits and pricing flexibility, the marketing strategies of successful companies will also depend heavily on the enlistment of new partners. There are now a number of utilities taking new approaches to their traditional areas of business through very innovative marketing arrangements – in combination with gas utilities, energy service companies, financial and energy brokers, manufacturers of controls and other electronic hardware and software, and even their own customers, as the following examples show:

- Enron Energy Concepts (owned partially by Enron and partially by a pool of commercial customers) does energy service contracts – starting with energy efficiency improvements such as lighting retrofits, then other types of more complex service packages.
- Entergy/SASI provide service packages – lighting and rooftop HVAC² linked via remote communications and metering devices to central controls, to small commercial end users.

- Duke/Dreyfus is now working with Johnson Controls to expand Duke Power's traditional utility services and Dreyfus' expertise in power marketing to consumer appliance controls (for residential load shifting purposes).
- EA Technologies in the UK capitalizes on integrated controls, installing controllers in consumers' homes to implement thermal storage.
- Louisville Gas and Electric's subsidiary (LG&E Energy Services) is centring around both utility and non-utility generation, a new energy services marketing and brokerage business and independent power projects.

To conclude, as new sources of customer value are discovered daily, the responses to customer needs are increasingly site-specific and time-dependent, relying heavily on the convergence of expertise in energy efficiency, information technology and "virtual business." The success of a company in the convergent and competitive energy markets of the future will depend highly on its capability to integrate technologies for customer use and to partner well.

iii) PROPOSED STEPS FOR IMPLEMENTING COMPETITION IN THE RETAIL ELECTRICITY SECTOR

We propose that restructuring of the retail sector should proceed in the following steps:

- In 1997, all utilities in Ontario (public and private) are required by law to separate their (to be regulated) wires / delivery functions from their (to be unregulated) competitive energy sales and services functions.
- Between 1997 and 2000:
 - Hydro establishes a separate retail sales function and makes plans to have the PAP in place.
 - A new entity (Wiresco) is created by legislation from the wires of all public utilities, which then receive share capital equity in the company. The intent is that the distribution function within Wiresco will be administered by a few (possibly five) regional entities by the year 2000.
 - Existing electric utilities retain their monopoly retail sales franchise in their geographic service region or have the option of moving their retail supply function to the PAP.
- In 2000, all electric utilities lose their sales franchise in their geographic service region, and all customers are able to choose the agent from whom they buy electricity. Electric utilities may choose to remain in the energy sales and services business on a competitive basis.

- Also, in 2000, any entity can become a licensed agent to sell electricity and energy services to end-use customers, competing with other ABMs, ESCOs or the PAP.

iv) ISSUES ASSOCIATED WITH RETAIL RESTRUCTURING AND COMPETITION

Ownership

While the proposed structure does not require a change in ownership of the wires from current hands, neither does it necessarily require public ownership. Ownership of the transmission and distribution system(s) could be public or private. Efficiency gains under private ownership could be small, as regulation would already be driving efficiency improvements. Also, competitive pressure on T&D tariffs might ultimately be provided by small-scale, distributed generation. However, innovations and creative uses of technologies might better be driven by private ownership, as convergence occurs.

Symmetry of Regulation with that of Other Industries

As noted earlier, direct retail access is expected to facilitate the cross-over and partnering of electricity and other services (such as natural gas, water services, telecommunications, home security and information services). The regulatory framework for the retail electricity market should allow this to happen. (See Chapter VI on Regulation).

VI LEGISLATIVE AND REGULATORY CHANGES FOR RESTRUCTURING

This section will address legal issues and in particular, matters which may require legislative or regulatory solutions.

In this proposal, many independent entities are proposed, with potentially either public or private ownership. As one of the interim steps to retail access, Ontario Hydro will need to create a structure which will more easily translate to a competitive market. A possibility is a multi-business, holding company structure with separate subsidiaries for the Central Market Operator, generation companies, Price Averaging Pool and transmission and distribution assets (in preparation for divestment to Wiresco). These would be segregated to minimize allegations of self-dealing. Market behaviours could be learned and preparation for retail access would be actively pursued.

If such an entity were to be created, it is important to model it on an OBCA-type company, with a share capital structure and the capacity of a natural person, with subsidiaries with similar attributes, to create flexibility. The owner of the issued share or shares could be established in the enabling legislation, thereby formally confirming the issue of Hydro's ownership by the Province. (There is precedent for this in the public sector, such as the Ontario Energy Corporation, which has a share capital structure with identified ownership of the shares.) It is critical that any interim entity have flexibility to move to the retail access end state without further extensive legislative change.

A. LEGISLATION

Implied in all the discussions about restructuring the electricity industry is the legal ability to carry out those changes. On its own, Hydro has no authority to implement many of the scenarios, and it is only with government intervention, by means of new and amended legislation, that such change will occur. Ontario Hydro is subject to many legislative enactments and is party to numerous contracts and agreements. While it is not possible to set out the precise legislative framework until the structure develops, consideration would certainly have to be given to the following matters, at a minimum:

The Power Corporation Act – the PCA would have to be withdrawn or substantially amended. Aside from the parts which create Hydro and which would be obsolete, the PCA contains other significant provisions, for example, creating pension plans for existing employees, which would need to be modified. A new act may be required.

Water Rental Agreements – Hydro has entered into a number of agreements under which it holds water rights; transfers and assignments would need to be negotiated. Hydro's voluntary guardian role for the watershed system would need to be transferred to a regulator, when the hydroelectric assets are transferred to the private sector.

Aboriginal Land Claims could affect the sale of hydroelectric assets.

Municipal Electric Utilities – Legislation having impacts on the mandate of MEUs would have to be changed. This would include the Public Utilities Act, the Municipal Act and the Municipal Franchises Act.

Nuclear Facilities – Ontario Hydro holds licences from the AECB for its nuclear facilities. Approval to transfer licences to others will likely be required.

Existing Contractual Arrangements – Significant among these would be contracts for fuel supply and contracts with NUGs, which would need to be transferred or re-negotiated. Failure to do so in regard to the NUG agreements may raise a significant issue of stranding costs in the range of \$2 billion. Similar problems were encountered during the deregulation of the natural gas industry.

Ontario Energy Board Legislation – Consideration of the future mandate in regard to electricity would be undertaken.

These examples demonstrate that there is a significant new legislative framework to be developed to change the industry. Other areas, as noted below, which will require new legislative provision are the creation of the Price Averaging Pool and the Central Market Operator as separate public entities and the formation of the new regulatory framework.

B. INDUSTRY REGULATION

While regulation can influence restructuring, it is industry structure which should determine the appropriate regulatory structure. Then, in

changing the regulatory structure, several questions must be separately addressed:

- What are the public policy objectives?
- What will be regulated?
- What will the regulatory framework be?
- What is the most appropriate type of regulation?

In contemplating the roles that external regulatory oversight might play, it is useful to think of regulation as either simulating or stimulating competition in order to improve economic efficiency. The regulatory framework may also serve a variety of public policy objectives, such as the protection of public safety, the conferment of special powers such as expropriation and inspection, ensuring adequate service provision and the protection of public resources to pursue public policy goals not directly associated with electricity provision (such as regional development, environmental stewardship or employment).

Canada's competition (or anti-trust) law, administered by the federal Competition Bureau and Competition Tribunal, can be thought of as a form of regulation designed to complement competition by discouraging collusive or exclusionary practices, discouraging anti-competitive mergers, or preventing abuse of dominant market positions.

Similarly, in an industry characterized by some elements of natural monopoly and some areas of potential competition, a major role of regulation should be to complement the role of competition by ensuring a level playing field particularly

where the competitive and natural monopoly elements of the industry interface (as they inevitably will). With respect to those elements of the industry where competition is both unlikely and indeed inefficient, that is, the natural monopoly elements of the industry, regulation serves as a substitute for competition by attempting to ensure that pricing and output decisions as closely as possible replicate those that would prevail under competitive conditions.

There is a risk of creating a second tier of decision-making where all major decisions of the management of the natural monopoly are reviewed in what are often protracted and expensive public decision-making processes. In general, the more competition can be fostered, the less there is need for detailed direct regulation, and correspondingly greater scope for more dynamic and entrepreneurial decision-making in the industry in question.

An examination of regulation in other jurisdictions does not demonstrate that preference is converging on one structural model or on one form of regulation. There is some enthusiasm for the promise of lighter-handed, less intrusive forms of regulation such as incentive regulation, if the traditional cost-of-service regulation drawbacks can be avoided.

i) REGULATORY ISSUES IN THE TRANSITION TO A COMPETITIVE MARKET

As industry changes to a competitive market, there is an expectation that less regulation is needed. The nature of regulation will change. However, to change the industry, three problems must be solved, potentially by regulation:

- *Stranding of Costs* is a potential concern if assets funded by Province-guaranteed debt cannot compete under open access, at prices which will recover their embedded costs.
- *Self-dealing* is a potential problem if Hydro-owned generators are competing through a spot market operated by a Hydro-owned Central Market Operator (CMO) and through a constrained Hydro-owned Wiresco.
- *Market Power* is a potential concern for establishing effective competition in generation if Ontario Hydro or its successor continues to own most of Ontario's generating capacity and supply most of Ontario's needs.

The extent of the problems of stranding of costs and extensive market power (which are detailed in the other chapters) requires quantitative analysis to determine the relative position of Ontario's investment in electricity infrastructure in a competitive market. There are a number of mechanisms for dealing with stranded costs such as a regulator imposing a stranding charge on all customers via transmission or distribution tariffs, or the imposition by government of a stranding tax. For example, a non-bypassable Competition Transmission Payment by Ontario electricity consumers can be structured to collect the difference between revenues earned in the market and revenues required to recover the costs of past prudent investments made on their behalf. The payment could be structured with incentives for generators to reduce stranded costs and would decrease over time until market revenues equalled revenue requirements. If spot market prices increase after 2000, there is less concern about stranding of costs.

Many of the concerns about self-dealing in generation are relieved if Hydro's generating assets are under separate ownership from Hydro. An alternative to the divestment of generation in addressing self-dealing would be to have the CMO's dispatch function associated with introducing competition in electricity into Ontario, divested from Hydro ownership. This central market operator would remain in government control and, in preparation for competition, this divestment could occur before 2000. If transfer of ownership is not possible, they should be at least functionally separated.

Concern about Hydro's market power would be lessened if the Ontario market became part of a broader market involving other provinces and/or the northeast US, so that Hydro's generation (comprising less than 20% of the northeastern North American market) is competing with generators in surrounding states and provinces. It appears very likely that such a market will evolve, and divesting generation to solve market power concerns is less important. Therefore, divestment of generation to a number of different owners need not take priority over functional separation of generation in a single block to compete effectively in a North American market.

ii) TYPES OF REGULATION

Generally, there are two types of regulation which are commonly used within the utility business:

Cost of service (Return on Rate Base): The regulator sets the revenue requirement for the utility as equal to the sum of the expected oper-

ating costs, depreciation, taxes, interest costs and a return on equity for the investors.

This type of regulation has been widely criticized for failing to provide sufficient incentives for efficiency gains and for over-capitalizing of the industry. If actual revenues are greater than the amount established in the revenue requirement, then the overall price level should be reduced in order to re-establish the original revenue requirement. As long as the prices are not adjusted, the shareholders are better off since they are earning a rate of return which is greater than the cost of equity used to determine the revenue requirement.

If costs are not constrained and actual revenues are less than the revenue requirement, profits will be below those expected and overall rates will be increased so that shareholders once again can expect to earn their cost of equity.

Therefore, there are no direct incentives for management to operate efficiently. The lag in the timing of regulatory hearings can be manipulated for maximum benefit of the shareholder at the expense of the customer. Cost of service regulation is also criticized for its costly hearing process, a cost ultimately passed on to customers.

Incentive: The guiding principle is that the management of regulated utilities will behave more efficiently in terms of cost restraint and investment decisions, if the shareholders are the ultimate beneficiaries of improved performance. Management's interests are aligned with shareholders' through incentive contracts and stock options. If management makes poor decisions,

shareholders can remove management. Price caps are an example of incentive regulation – there is a cap on the average price that can be charged by the utility.

While the profits are higher under incentive regulation as long as the management makes appropriate operating decisions, the productivity offset, depending on the formula, can ensure that the benefits of improved operations will be shared with either shareholders (until re-adjustment) or consumers through lower prices. To ensure that system reliability or quality of service is not impaired, the utility may commit to a service performance guarantee. Pricing and investment risk are allocated among shareholders and consumers. Under cost of service regulation, price and investment risk is born by the consumer. Price caps are typically used with monopoly elements.

The cost of price cap regulation is small compared to cost of service regulation. After an initial hearing which establishes base information and benchmarks, annual filings on service prices and quantities suffice to determine if the cap is being met. Over the period of the price cap, there are no hearings.

Ontario Hydro has self-imposed a price cap, which was confirmed by the Minister of Environment and Energy, of no rate increase until the year 2000. Incentive regulation in publicly owned companies will be most successful where management's incentives are based on improvements in costs or efficiency, as a proxy for shareholder benefits.

iii) REGULATION IN THE TWO-PATH STRUCTURE (Post-2000)

The proposed Two-Path structure relies on maximizing competition and market values. As the competitive industry evolves, there may be components in which both competitive and monopoly functions will reside (such as the Price Averaging Pool), necessitating a mixture of structural and regulatory responses which deal properly with each.

If competition does not emerge, it may be necessary to have some regulatory intervention. This mandate currently falls to the federal Competition Bureau. This will raise complex issues of federal and provincial interaction on electricity regulation and the need to avoid duplication and inconsistencies between the two levels. If all provincial electricity supply systems become competitive and disputes arise between provinces, presumably the federal level will resolve them. Similarly, NAFTA issues and alignment of regulation to allow Ontario generators reciprocal access to US markets will require federal intervention, as will convergence issues with telecommunications. The National Energy Board (NEB) will also play a role in the emerging North American marketplace.

This section addresses the regulatory needs of each component of the Two-Path structure once it is in place.

Generation

The price of generation will be determined by market forces, while generation planning will not be subject to regulation except for environ

mental assessment approvals where alternative options might be evaluated through an integrated resource planning (IRP) process. There may be an ongoing oversight role to ensure real competition is occurring (which may overlap with federal jurisdiction) and price caps may be introduced if competitive pressure fails to stop escalation of generation prices.

Central Market Operator (CMO)

The CMO, as the independent market and system operator, will have its own set of rules, comparable to a stock exchange, in that it will be a crown corporation, with government oversight, with representation from its members, and essentially self-regulated (The rules may be reviewed and approved by a third party before implementation). The CMO will perform regulatory oversight functions in ensuring that the market is operating fairly and equitably, with some transparency of activity to satisfy the participants.

Wiresco

As a natural monopoly, many of the regulatory concerns will be the same as in other regulated monopoly industries: asset valuation procedures, tariffs, stranded costs collection, comparability, transparency, access, conflict resolution. However, some will be specific to the electricity industry: congestion, land expropriation powers, obligations to connect, service quality and reliability standards, technical and safety standards, coordinated planning, and investment decisions.

Regulation can assist in ensuring low prices, fairness, equality, availability and quality of service and compatibility with public policy. Regulation

should ensure that financial returns to the owners are fair and that they have appropriate incentives to drive efficiency and innovation. Should Wires tariffs for rural or remote regions include some subsidization, the degree and form of this, also will need regulatory oversight. Investment in new transmission and distribution facilities would require environmental approvals and a needs test to ensure that such expenditure represents the lowest cost option (vis-a-vis new decentralized generation), and that this monopoly component was serving its common carrier role in a fashion that benefits access by customers to generators and eliminates the potential for self-dealing with generators.

Since comparability of access to transmission and distribution will be a common need for all generators and customers, it may also be the appropriate mechanism for recovery of any stranded investment costs. Quality standards for connection to the transmission system and the obligation to connect can be handled by means of codified regulations, with minimal oversight.

As discussed in Chapter V on Competition, the issue of congestion has become important. A regulator would be interested in ensuring that practical mechanisms and models for congestion management are developed and incorporated into the marketplace rules.

Price Averaging Pool (PAP)

It may be necessary to create the PAP by legislation, in order to give it the mandate to serve any and all customers, to establish its not-for-profit status and to define its mandate in terms of prin-

ciples of fairness to customers, perhaps with some cost allocation rules. Such legislation will essentially be the "regulation" of the PAP.

Agents (Aggregators, Brokers and Marketers)

Some form of licensing based on market entry standards will be required, as well as rules of conduct for retail sales.

Regulation of Municipal Electric Utilities

The PCA and Public Utilities Act give Ontario Hydro the responsibility of regulating any entity that purchases power from Ontario Hydro for re-sale. This regulation, which is based on cost of service, includes the approval of rates and charges for electricity and utility services, and the approval of significant financial transactions. These financial transactions would include, among other things, the utilization of funds surplus to operating need for capital works, the borrowing and issue of debentures, and the sale of assets.

Ontario Hydro also issues provincial standards and guidelines for the application of rates related to electricity and accounting and reporting standards that form a consistent basis for the filing of annual information returns and applications for approval. This regulation currently applies to 306 municipal electric utilities and two private distributing companies which collectively file some 750 applications for approval each year as well as annual information filings. These are reviewed by a centralized staff and approved by Ontario Hydro as regulator.

Clearly, the MEU distribution tariffs, as well as those for transmission, would be the concern of the independent regulator – a role in which Hydro cannot continue. Ontario Hydro recommends that its regulatory authorities be transferred immediately, either to the OEB or local municipal councils until such time as the Wiresco can be created.

The MEUs' role must also change; it is proposed that there be created a single provincial Wiresco before 2000. Once this occurs, the remaining MEU function is the purchase of power for resale and the provision of energy services on a competitive basis to customers. In a new industry the buy and sell function would be handled by aggregators, brokers and marketers, for those customers who want someone to do their buying for them, or by the customer, or by the PAP (which will serve those customers who do not wish to choose a supplier). The larger municipalities may want to offer ESCO or ABM services to their constituents. Like those businesses, they would need licensing. Overall, however, the MEUs' current monopoly statutory mandate will need to be withdrawn due to its obsolescence in a retail access scenario.

Regulation of Electrical Installation Safety

The provincial government has placed the responsibility and authority for regulating the safe use of electricity and electrical equipment in Hydro. Hydro makes regulations, including the Ontario Electrical Safety Code, with the approval of the Lieutenant Governor in Council. Ontario Hydro Inspection maintains offices throughout the province for the purpose of

inspecting electrical installations and equipment. A large number of installations are inspected by a relatively small workforce, at no cost to Hydro. If the industry is restructured, this function must continue, however, it may no longer be appropriate for Hydro in its unbundled form to administer it.

An objective is to achieve consistency province-wide, which is of paramount importance for safety reasons, and to preserve the integrity of the system. One option is that the inspection function, while maintaining a self supported provincial structure, will report to another provincial government body, such as a separate corporation or board. In some provinces, such as Alberta, the enforcement for various safety codes (electrical, building code) has been delegated through a Safety Codes Council to local municipalities, accredited corporations, or independent agencies which are approved. (This system may have significant drawbacks in Ontario. Consistency will be difficult to maintain, and it is possible that conflicts of interest will arise for profit-making inspection companies or corporations with employees performing inspections on their premises. It is important to avoid such problems in re-assigning the authority.)

Environmental Regulation and Sustainable Energy Development

There are a number of potential regulatory mechanisms available to address sustainability without distorting the underlying marketplace. As Ontario's electricity industry moves toward greater competition, two needs dominate the environmental perspective on regulatory change:

A Level Playing Field: A number of regulations, including the Ontario Environmental Assessment Act, Countdown Acid Rain legislation, and conditions on Certificates of Approval (for environmental assessment, re-licensing, etc.) must apply uniformly across all energy sources, regardless of ownership (the Environmental Assessment Act currently applies only to public sector projects, such as Hydro generation and transmission facilities and energy from municipal solid waste facilities).

With respect to market rules for operation of the spot market, levelling the playing field could entail the establishment of an environmental "entry standard" to be met by any generator selling into Ontario, the publication of, and customer access to, environmental performance reports on all generators, or the application of a surcharge on non-Ontario generators which do not meet provincial environmental standards. A level playing field with potential Canadian and American competitors would necessitate harmonization of federal/provincial and Canada/U.S.A. environmental regulations.

Privatization of hydroelectric stations would necessitate the ownership transfer of associated water rental payments and rights. (Regardless of hydroelectric ownership or re-configuration, we would favour an ecosystem approach to watershed management, with that as the basis for water rental payments.)

No Loss of Environmental Quality: Maintaining environmental quality in Ontario, given the changes under consideration, will necessitate considerable changes to the provincial regulatory

framework and agreements within it. Overall, the current regulatory reform process should facilitate greater efficiencies within the electricity sector. Hydro would favour pollution prevention actions, particularly voluntary plans (rather than government-imposed and more costly end-of-pipe solutions).

Re-configuration of generation businesses might necessitate a re-negotiation of responses to existing federal and provincial voluntary programs (such as the NO_x/VOC Management Plan). Privatization of fossil stations would require a re-assessment of acid gas emission limits (with broad regional emission caps and market-based instruments such as tradeable emission reduction credits, preferred).

It is assumed that federal regulations applying to nuclear facilities, such as those pertaining to radioactive material management, would be unchanged.

There are also a number of market mechanisms for addressing environmental performance – for example, customer access to bilateral contracting, to enable not only purchases of environmentally preferred “green” power, but also to ensure that (barring delivery constraints), the generator from which they purchase, actually runs.

Promoting Energy Conservation and Renewable Energy Technologies

In a competitive market, the development and promotion of energy efficiency standards in appliances and building codes, public education

and communication on energy conservation will be viewed as having societal and perhaps, long-term value, but little customer-specific value in the shorter term. Consumers and environmental advocates in most jurisdictions undergoing similar electricity sector restructuring, argue that the government will have to play a larger role in promoting energy conservation.

For example, in Norway, independent regional energy efficiency centres, funded from a wires charge, will promote energy efficiency through information and consulting services. In the UK, the Energy Saving Trust promotes energy efficiency with the proceeds from an annual levy on each customer (about \$2.00 Cdn annually). Energy efficiency standards could also be regulated, in new buildings and rehabilitations of old buildings, through building codes.

Support for renewable energy technologies (RETs) will likely weaken. The majority of these are still more costly than conventional generation, even when their environmental advantages are factored in. There are a number of regulatory means to encourage RETs, including levies on electricity bills, legislated targets for RETs, a wires charge or some form of green pricing.

Regulation and Industrial Convergence

The regulatory structure must be able to accommodate convergence, and therefore would be kept “bottom line” and performance-related rather than intrusive, with flexibility to merge its oversight of the electricity industry with that of regulators of other wired (telecom) or other energy service (natural gas) providers.

The role of the regulator should evolve with the market-driven changes in the industry. Part of its mandate must be to relinquish regulatory control when competition flourishes and, as unregulated activities, such as distributed generation or packaged energy and non-energy information services, develop. It must also work co-operatively with other industries and their regulators to ensure symmetry of treatment amongst participants in a marketplace which will increasingly overlap in terms of products, services and customers.

For example, the carrier role of a wires company could expand to serve several industries that have an information transmittal function. In short, the future role and specific functions of the OEB or its successor, and any other third party regulators, must be redefined in view of how the industry is restructured.

iv) INTERIM STEPS TO COMPETITION (1996-2000)

Regulators must concern themselves with the nature and pace of the change to be enacted and the means by which this will happen, to enable appropriate levels of competition and ensure consumer protection throughout the intervening period. It may be appropriate to establish an interim framework with appropriate levels of regulation for the emerging components of the industry. At this time, the following is suggested:

- Generation planning would not be subject to regulation except for EA approvals for siting.
- Delivery related issues would be reviewed by a regulator or other government overseer.

Principles to address consumer issues with each step of change might be needed to guide the transitional process. While the following is not an exhaustive list, attention must be given to such transitional tasks as:

- Determining that the market structure and rules of operation ensure equitable access, customer protection, and efficient use of provincial resources.
- Reviewing the pertinent legislation, regulations, codes and standards as well as roles of current regulatory entities, for both the changes needed to the existing elements and the need for new. (With different components of the industry having differing types and degrees of regulation, it will be necessary to clearly delineate the roles and rules for all.)
- Reviewing neighbouring jurisdictions' legislation and regulations to ensure symmetry of the emerging Ontario regulatory framework with these. Establishing interim protocols for conflict resolution, elimination of overlaps in federal/provincial jurisdictions, and other issues related to industry convergence.
- Ensuring the development of appropriate processes and mechanisms to address issues such as stranded costs, congestion, and the physical logistics of implementing retail competition (such as technical standards and connection charges for access to the wires, metering, billing and accounts reconciliation).

- Establishing an interim regulatory framework needed for the municipal electric utilities and other providers of retail services, such as ESCOs, aggregators, brokers and marketers.

Much of this work would involve setting up consultation processes with industry participants.

v) NATURE OF THE REGULATOR

The forms of regulation described for the different parts of the industry include such diverse tasks as price regulation, licensing, oversight, administering legislation, advisory capacity, reports to government and the setting of technical standards.

With an industry as complex as the electricity industry the idea of a single regulator, such as in the UK, with wide ranging powers, is one possibility. The risk, however, is that too large an administrative and bureaucratic entity will be created, which will result in inefficiency and will lack the ability to effectively carry out its duties. Also, in Ontario, not all of the necessary legal powers are carried out by provincial bodies. As mentioned elsewhere, the federal government has the responsibility for regulating competition matters, including mergers and acquisition, and anti-competitive acts. Similarly, some tasks will be carried out by self-regulation. For instance, the CMO, will need to set rules for the market, and should have an advisory board consisting of representatives of its users; licensing of ABMs could be administered by a body experienced in similar regulation such as the Ministry of Consumer and Commercial Affairs; Wiresco

would set the technical standards for connection to the common carrier by suppliers and customers.

Therefore, it may not be possible or desirable to have a single regulator in Ontario. Oversight functions may be more appropriately continued by or assigned to existing bodies with some experience. In the case of the CMO, with its "stock exchange" and financial/paper market aspects, oversight of its members may be best suited to the Ontario Securities Commission. Oversight of the competitive marketplace would be handled by the Competition Bureau and Tribunal. Oversight and licensing by the AECB for nuclear generation would continue. Existing environmental oversight would continue, with application to all participants on a level playing field.

Other functions, primarily the setting of the price tariffs for Wiresco, would be assigned to a different regulator with experience in the setting of rates. While it will be important to have transparency and consistency of treatment by all regulators, and clearly defined roles to avoid overlapping jurisdiction, not all market participants will be in all facets of the industry and so it should not be overly burdensome to comply with different regulators for different forms of regulation.

VII OWNERSHIP AND FINANCIAL RESTRUCTURING

The preceding chapters of this document have discussed the need to restructure the electricity industry in Ontario and its regulation to provide overall benefits to the Ontario economy. This chapter discusses the role that ownership and ownership change can play in meeting the objectives of industry restructuring. This is a key policy issue that the Government of Ontario must consider since it is the current owner of Ontario Hydro and has legislative authority over the publicly owned electricity infrastructure in the Province.

The ownership structure of the industry can change in many ways. For example, elements of the industry could be transferred to other entities, public or private. New market entrants, either public or private, occasioned by the advent of competition would also change the ownership structure of the industry. Strategic partnerships, alliances and joint ventures with converging interests will have a similar impact.

Privatization represents a change of ownership through the sale of a publicly-owned asset or company, in whole or in part, to private sector investors. While that is the focus of Sections A and B, which deal with Generation, Section C examines other forms of ownership change, in addition to privatization.

A. OBJECTIVES OF PRIVATIZATION

Before describing Hydro management's views on the ownership structure for the industry, the following is a brief discussion of some of the

objectives which the government should consider in pursuing privatization.

TO ENHANCE COMPETITION AND BENEFIT ONTARIO'S ECONOMY

Privatization of the competitive parts of the Ontario-based electricity industry will increase the likelihood that they will be competitive and successful over time. This will provide benefit to the Ontario economy in general by inducing competitive behaviours such as:

- the drive to retain and even increase market share both inside and outside Ontario,
- pursuing growth through new revenues sources and convergence with other industries, and
- a corporate attitude oriented toward, and rewarded for, efficiency improvements.

Such behaviours are best encouraged by private ownership. Market discipline and pressure from shareholders will ensure that the necessary skills are employed to drive these behaviours.

TO TRANSFER RISK FROM TAXPAYERS TO INVESTORS

As the competitive nature of the industry increases, market share and revenue are more at risk. In a competitive market, attractive prices and service offerings determine a utility's revenue streams, not the utility's costs. This means competition shifts revenue and price risk

from customers to the utility's shareholders. Other risks include operating, technological, financial and environmental risks. When the utility is government owned, the taxpayer bears all these risks. Privatizing those parts of the industry subject to competition would transfer these risks to investors willing to assume them, in return for the rewards of ownership. The degree of risk transfer to the private sector would also depend on the pace at which any government guaranteed debt associated with the privatized entities is defeased.

TO EXTRICATE GOVERNMENT FROM THE BUSINESS

With the structural changes in the electricity industry including the emergence of competitive markets, the rationale and continued relevance of government involvement is being challenged. Electric power, and in particular the generation of power, is increasingly viewed around the world as a commodity. The provision of power as a commodity is less and less seen as needing government ownership.

The Ontario Government may want to extricate itself from the accountability for a business which can be adequately provided by the private sector, and prefer the more transparent route of providing oversight through regulation. Public policy objectives currently pursued through ownership of Hydro could also be dealt with through regulatory or by other legislative means such as energy taxes.

TO PROVIDE PROCEEDS TO GOVERNMENT

Privatizing electricity industry holdings could also provide the government with a source of

cash through the monetization of utility equity and through increased taxes. Over time these proceeds could then be used for other purposes such as deficit reduction. If this is a key objective for the government, it will be important to approach privatization in ways which attempt to maximize sale proceeds. Pursuit of this objective in turn may require some trade-off with other objectives, such as the early promotion of a competitive market.

TO REDUCE GUARANTEED DEBT

Privatization of parts of Hydro will also allow the government to reduce its contingent liability through reductions in the amount of guaranteed debt. Hydro's debt is currently guaranteed by the Province and while the privatized entities would likely be capitalized initially with some government guaranteed debt, this would be defeased over time.

B. ON PRIVATIZING GENERATION

Competition has emerged first in the generation sector. Therefore, it is our position that the best place for privatization to begin is in the generation assets.

There is no longer a strong rationale for, and in fact considerable risk in, continued public ownership of much of Ontario's electricity industry. Furthermore, there are significant benefits to be achieved through private ownership. A staged transfer of ownership to the private sector of many of the functions of the industry should begin with generation.

Government should also consider that deferring the privatization process in the face of increasingly more competitive markets could

increase the risks borne by the government and may jeopardize the realization of a fair value for past investments in the industry. A pictorial representation of the proposal on ownership are provided in Figure R. Further detail and rationale is provided in the following sections.

There are a number of compelling reasons for privatizing Hydro's generation. While it is competition which is by far the most important driver of efficiency and innovation, privatization (whether before or after the introduction of competition) would deliver on other objectives such as transferring risk and reducing debt and government involvement. Privatizing in advance of open retail access would achieve these benefits earlier.

During the transition to competition (before 2000) there would be a spot market in energy and contracts between the Gencos and the power pool. In this time frame, the limited competition and the contracts with the Gencos would provide increased assurance of earnings to purchasers, thereby enhancing sales proceeds.

Prior to any privatization of Hydro's generation, the industry structure and associated regulatory rules need to be defined. Some issues unique to hydroelectric and nuclear generation also need to be addressed.

One such issue with hydroelectric generation is potential public opposition to transferring to private hands ownership of a natural resource that Hydro has traditionally helped manage on

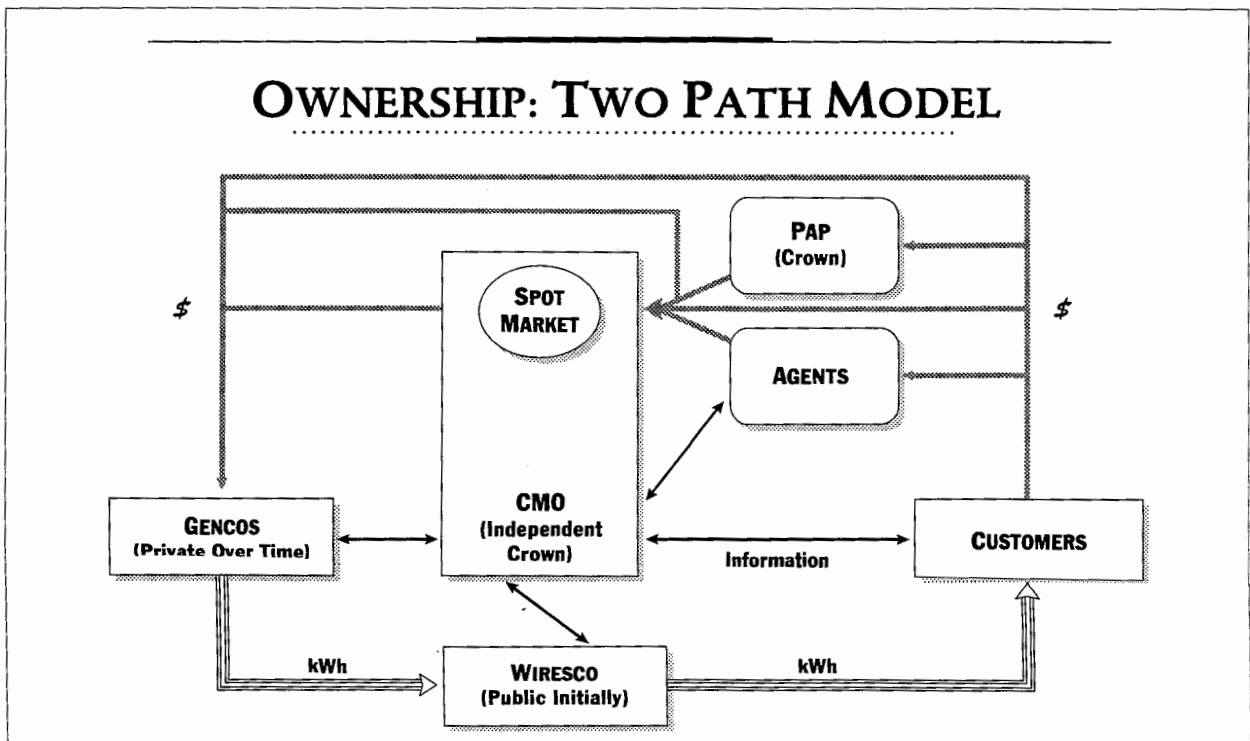


FIGURE R

behalf of the Province. A second is the possible concern of aboriginal peoples in having their voice heard by private owners with respect to both watershed management and land claims.

For nuclear generation one issue is that many Ontarians may be concerned that safety standards may deteriorate under a profit-oriented private owner. A second issue revolves around the liabilities associated with nuclear waste. There will likely continue to be public discomfort about long-term waste disposal/management until a solution has been determined. This uncertainty can be expected to be an issue for investors.

Currently there is a Federal hearing process reviewing the acceptability of concepts for nuclear fuel waste management. More information and comfort with the concept are expected when the hearings conclude and the waste producers and the Ontario and Federal governments establish policies for next steps. There is great merit in transferring liability for existing waste with asset ownership, because the operator should manage nuclear waste. Certainly this issue will influence valuation and requires a clear determination.

In addition to addressing the above questions, preparation for privatization of generation also must address the configuration of the privatized Gencos. Generation configuration has been discussed in the chapter dealing with competition. For the reasons indicated in that chapter nuclear generation should be kept whole. When

generation configuration options are assessed against the industry restructuring objectives, it is apparent that different objectives will drive different configurations necessitating the need for trade-offs.

In order to advance our understanding of these trade-offs, we developed illustrative generation configuration options to see how existing generation assets might be grouped for competition and sale. These illustrative generation configurations and their assessment against restructuring objectives are summarized in Figure S, and discussed below.

- Selling the generators as an integrated whole, would gain some privatization benefits, but may give too much market power to one entity and not promote intra-Ontario competition;
- The establishment of a nuclear company on its own would limit the ability to create a number of independent and competing generation entities of equal size and capability.
- Keeping non-nuclear (hydroelectric and fossil) as an integrated company would position it very well for North American competition, but competition inside Ontario among the integrated hydroelectric and fossil entity, independent power producers and interconnected utilities may be inadequate;
- Splitting the non-nuclear assets along technology and fuel lines (a separate hydroelectric Genco and a separate fossil Genco, as they

GENCO CONFIGURATION

OBJECTIVE	CONFIGURATION
• Maximum market value	• Single integrated Genco
• Maximum synergistic benefits	• Few large Gencos, maintaining fuel integration
• Maximum intra-Ontario competition	• Many smaller Gencos
• Maximum customer choice	• Many smaller Gencos, some fuel specific
• Maximum competitive position	• Large Gencos
• Good market value • Some synergistic benefits • Some intra-Ontario competition • Increased customer choice • Good N.A. competitive position	• Single nuclear Genco • One or two blended hydroelectric and fossil Gencos
• Maximum risk offloading	• Divest nuclear
• Maximum return	• Sell hydroelectric

FIGURE S

are currently configured as strategic business units) would create only slightly more intra-Ontario competition than exists today until the market is opened;

- Splitting the non-nuclear assets into two mixed-fuel companies (comparably sized with equal access to interconnections, each with some hydroelectric and fossil) would promote some intra-Ontario competition between entities, but would lose some of the benefits of fuel-specific integration such as fuel purchases, integrated provincial watershed management, etc.

In the latter three cases, the nuclear business can be privatized separately or via joint ownership with the non-nuclear Gencos.

In terms of the objectives to be pursued through privatization, it is likely that privatizing Nuclear generation would offer the greatest transfer of risk, while privatizing Hydroelectric generation is likely to realize the highest proceeds to the government.

All of these considerations and trade-offs would affect both the competitiveness of the successor generators, and their sale price.

To maximize the net benefits of privatization, whether before or after open access, more work is needed to establish the appropriate configuration and the appropriate timetable for privatization. Together with confirmation from the government of the objectives it wishes to pursue through ownership change, this would allow the

preparation of a privatization proposal which provides adequate value to the shareholder.

In deciding on the most appropriate generation to divest, the Government must also be mindful of the impact of such a divestiture on the future business strategy and viability of its remaining non-divested assets. In the event that the government chooses not to privatize nuclear concurrently with hydroelectric and fossil, an option would be to place nuclear assets in a separate Crown Corporation, whose privatization could be pursued separately. This Crown Corporation would be owned by the Province of Ontario with regulation of the nuclear operations continuing under Federal jurisdiction. Specific nuclear ownership options to be investigated could include a merger or other association with those parts of AECL that support CANDU technology, or part ownership by Canadian private sector nuclear interests such as equipment manufacturers, or joint ownership by any newly created hydroelectric/fossil Gencos.

If the nuclear business is not privatized in the near term, becoming a separate Crown will enable a focus on the pursuit of operating efficiencies. During this period, nuclear energy and capacity sales would need to be subject to contracts that enable it to recover costs but which also provide an incentive for efficiency improvements.

THE IMPLEMENTATION OF PRIVATIZATION IN GENERATION

The proceeds from privatization could be enhanced by careful consideration of the options available for its implementation. The sale may

be carried out by either a tendered solicitation of offers from potential purchasers, or an initial public offering (IPO) of common shares. Both approaches have individual merits and compatibility with different objectives and substantial work will be required to determine the most appropriate approach.

In general, tenders give more control in selecting a buyer who will control the business and in some cases greater proceeds to the seller, if the buyer perceives and pays for a particular strategic fit between the business being offered and its own operations. Also, tenders can allow the seller to extract more commitment from the buyer on certain public policy and other issues. On the other hand IPO's provide a wider distribution of ownership with no controlling shareholder initially and provide a larger pool of capital to draw upon.

There are numerous considerations that should be taken into account in implementing privatization. The following is a discussion of some key considerations:

- *Size of the Offering:* Full or partial privatization of Hydro's generation would be large, almost certainly the biggest ever in the history of this country. The largest in recent history was the flotation of CN Railway (\$2.2 billion). Full privatization of Hydro's generation assets would likely require staging in more than one tranche; this may also help fine-tune the valuation to ensure fair value for the assets received. This has been argued in the privatization of electric utilities in the UK, but has not been generally true in the Canadian experience.

- **Timing:** Typically, prospects for privatization are best when there is clear definition on the structure of the industry and the associated regulatory and market rules.

Notwithstanding this requirement, the current market conditions, particularly for IPO's, are excellent. The low inflation rate has reduced the yield on long-term bonds to the lowest levels seen in over three decades. This has had a very positive impact on stock valuations, especially utility shares. In general, low and potentially falling long-term bond yields will favourably impact the valuations of utility assets. This argues for an early sale unless the current shareholders believe valuations will improve further in the future.

If privatization is implemented in parts, the time between issuance of the different tranches should be minimized, unless there are other public policy considerations. Fair value is best obtained by removing uncertainty about the impact of continued partial government ownership and the overhang of future sales of equity. The role and intentions of the government or the holder of the remaining equity should also be stated at the time of the offering.

- **Debt:** The privatized entities would be capitalized with different proportions of debt and equity. These capital structures will likely be less leveraged than Hydro is at present. This may require the Government to temporarily assume some debt through a debt for equity swap. Each of the privatized entities would have to obtain a credit rating before they can

issue meaningful amounts of debt on their own credit. Until then the privatized entities could issue notes to the government to the extent of the required debt. Over time these entities would undertake funding under their own credit rating, with the proceeds used to pay off the notes and defease the debt currently guaranteed by the government. A similar approach was taken in the privatization of Nova Scotia Power.

The redemption schedule for the notes will primarily depend on the amount of debt the privatized entities can reasonably issue over time and the extent to which the government is willing to accept staggered defeasance of the existing debt. The opposing interests of the government and the future shareholders of the privatized entities on the question of debt should be noted, however. While the government will wish to defease the debt as rapidly as possible, the new entities will wish to spread out the defeasance over as long a period as possible.

- **Presentation and Preparation:** Purchasers are likely to pay a higher price if they have a better understanding of the business and its future potential. Success of the sale will require considerable investor relations and education work in the presentation of the merits of the assets being offered and a thorough understanding of the regulatory and environmental issues facing the businesses. Regardless of how privatization is achieved, whether through a tender process or IPO, much effort will be required to prepare the entities for privatization.

In addition to the considerations outlined above, there are numerous business, accounting, legal, and environmental issues that would have to be managed, before privatization.

C. OWNERSHIP CHANGES IN THE NON-GENERATION COMPONENTS OF THE INDUSTRY

TRANSMISSION AND DISTRIBUTION (WIRESKO)

This paper proposes the creation of a single Wiresko which would own assets of the current transmission and distribution facilities of Ontario Hydro and the MEUs.

The Wiresko would be owned by those who have contributed its assets. In consideration of the value of their contribution, municipalities could be offered part ownership of the generation businesses as well as or instead of shares in Wiresko. This would allow them to share in the eventual privatization of all major parts of the industry. Under this joint ownership arrangement Wiresko dividends could be paid to the owners, providing some cash flow to the Province and the municipalities.

While there are fewer benefits to be realized through a change of ownership of Wiresko due to its natural monopoly status, its eventual privatization could provide a driver for future innovation and the flexibility to pursue convergence opportunities with partners.

CENTRAL MARKET OPERATOR (CMO)

The Central Market Operator should be structurally isolated from the other components of the industry by setting it up as a non-profit,

independent Crown organization. This would further reduce self-dealing concerns. It is also proposed that this entity be set up as early as possible; there is no overriding rationale for its creation to await open retail access. This would allow useful experience during the transition period.

Continued government ownership would allow for additional oversight of the industry through this critical control function.

AGENTS (AGGREGATORS, BROKERS AND MARKETERS – ABMs)

Agents, marketers and brokers of power should be licenced to operate anywhere within Ontario and make purchases on their customers' behalf. These are expected to offer creative service and pricing packages, including risk management and financial transaction services.

PRICE AVERAGING POOL (PAP)

For those customers not wanting to shop for electricity supplies, it is proposed that non-profit Crown Corporation be established, the Ontario Price Averaging Pool (PAP).

OTHER PARTICIPANTS

With the elimination of retail franchises under open access, the provision of retail services can be performed by companies involved in other parts of the industry, by retail utilities wishing to do so, or by Energy Service Companies (ESCOs), all of which must be licensed. At some point, the convergence of the marketing and packaging of electricity-based products and services with those of other industries is

likely best be facilitated by private sector entities familiar with market growth pressures.

There are other components of the current publicly-owned utility – including all or some of the functions carried out by Ontario Hydro International Inc. and Ontario Hydro Technologies – that should also be privatized as soon as practical. There are benefits to the province from privatization in the form of increased entrepreneurship and innovation, as well as transfer of risk. Exploring the appropriate way to introduce private equity into these components can begin immediately.

D. PRIVATIZATION ISSUES

This section includes a discussion of some of the key issues raised by the privatization of parts of Hydro in addition to those discussed in the previous sections. The transfer of Hydro's generating assets to private ownership would be a complex and time-consuming exercise, involving the consideration of a broad range of issues.

TAXATION

Under Canadian tax legislations, corporations are required to pay taxes unless specifically exempted. With ownership change, the new privately owned entities will be required to remit taxes Hydro does not now pay. At the present, Hydro is specifically exempted from income, capital taxes, and municipal taxes. It currently pays approximately \$47 million per year in provincial sales and commodity taxes and customs duties, and additionally, approximately \$100 million per year in "grants-in-lieu" of municipal taxes. The potential tax impact of

privatization is addressed at each of the three government levels.

Federal: For a private entity, the Federal income tax rate of approximately 29% on taxable income would apply. There is also a large corporation tax of about 0.2% of taxable capital. There does not appear to be any specific tax exemption offered by the Income Tax Act (ITA) to privatized utilities. In 1995 the Public Utilities Income Tax Transfer Act (PUITTA), which was the major vehicle for reducing the impact of Federal income tax on privatized utilities, was repealed. The announcement of proposed amendments to the ITA to require, among other things, valuation of assets at fair market value for tax purposes upon privatization of previously tax-exempt corporations, also clearly sets out the federal government's view that such corporations would be treated as if they had begun a new existence or "fresh start," with a taxable status. Although about a third of Federal taxes paid would effectively flow back to Ontario, the residual Federal taxes represent a transfer of wealth out of the Province.

Provincial: Private ownership would attract additional provincial taxes including corporation income tax (about 15% of taxable income) and capital tax (0.3% of taxable capital).

Municipal: Additional municipal property and business taxes would also have to be paid under private ownership unless specifically exempted as part of the restructuring plan. These taxes, in the case of privatizing both generation and Wiresco, are estimated to be in the order of \$200 million yearly increase over the existing "grants-

in-lieu" basis. It should be noted that the methodology used for assessing hydroelectric generating facilities is under review and could result in even higher taxes.

Should any tax concessions be required to ensure successful privatization, they will have to be negotiated with various levels of government. The rationale for such concessions may include the possible enhancement of long-term tax revenues. However, other competitors in an expanded marketplace would likely demand a "level playing field."

THE COST OF CAPITAL

The cost of capital has traditionally been an important consideration for regulated utilities in determining the rates that they charge customers. In a competitive world, prices will be determined by the market and the cost of capital for market participants has reduced impact on the prices in the short term. However, private investors expect that over the long term, they will be able to earn a return at least equal to their own cost of capital.

Changes in ownership could affect the cost of capital in three ways:

- a) private investors expect a higher return on their equity investments than government owners (in the form of future dividend or cash flow, and capital appreciation);
- b) removing the provincial government guarantee will increase the cost of debt;

- c) an increased proportion of equity will be required in the capital structure which will result in higher cost of capital since the cost of equity is higher than that of debt.

In addition, a new entity's risk profile and expected financial performance also influence the cost of capital. For example, there are likely more risks and higher cost of capital associated with a privatized generation company operating in a competitive environment than for a privatized generation monopoly.

For an entity operating in a competitive market, cost of capital would be a factor in investors' valuation of assets, in addition to other considerations such as revenue growth, potential for efficiency gains and profit growth. The valuation is based on investors' long term view of possible returns. Generally, the higher the long-term forecast return above the cost of capital, the higher the valuation. The long term cost of capital and forecast return in the short-term can often have a lower impact on valuation as investors are often willing to accept lower returns in the short- and medium-term in exchange for long-term prospects.

For regulated monopoly assets, an investor would look to the potential for efficiency gains and the regulatory environment to provide assurance that costs and prices will allow an adequate return on capital.

REVENUE RETENTION/GROWTH

With the introduction of competition, there is a general tendency towards a loss of market share

to new entrants and other competitors. This has been the case in UK electricity market as well as in other industries such as telecommunications.

Private ownership and shareholder demands will increase the likelihood that the companies will manage threats to market share and pursue new growth opportunities by promoting more innovation and competitive behaviours. The impact of such factors will ultimately lead to the long-term success of the industry and the provincial economy in a competitive world.

EFFICIENCY GAINS

Responding to competitive market and shareholder pressures and regulatory incentives, significant efficiency gains have been achieved following privatizations in other jurisdictions. Such gains have been made by electric utilities as well as in other industries such as telecommunications and airlines. For example, in the privatization of the Central Electric Generating Board in Britain, staff reductions of about 40% were achieved in four years after privatization and the introduction of competition, with some further reductions underway currently in the privatized companies in the order of 15% from the reduced levels.

Hydro has reduced its OM&A cost by about 30% since its internal restructuring in 1992, accompanied by a similar magnitude of reduction in regular staff level, while delivering greater amounts of energy to customers. The planned capital program has also been significantly reduced providing limited potential for further reductions. With fuel costs already reflecting

current market conditions, little gains are expected in this area. However, greater commercial focus and other private sector practices that come with private ownership, could result in further cost reductions in the order of 10% to 20%.

SYSTEM PERFORMANCE/SECURITY

Privatization or other changes in ownership should not affect the security of supply, since market forces (through price signals) would be sufficient to ensure both adequate supply over the short term and the addition of new capacity over the longer term. This has been demonstrated not only in the electricity industry, but also in other deregulated and investor-owned industries such as gas and telecom.

OWNERSHIP OPTIONS/RESTRICTIONS

The privatization of some of Hydro's generating facilities would likely result in the largest public share offering in Canadian history. Any ownership restriction such as limitations on shares held by non-residents could impact negatively on the value and size of the offering. However, the government may choose to have certain restrictions to meet other policy objectives.

Transferring ownership to the private sector and creating a share capital structure for the industry offers important opportunities to better align employee interests and corporate interests through employee ownership and gainsharing. Active employee participation ought to be encouraged and assisted to help enhance commercial focus and efficiency gains that are to be realized by privatization.

ASSET VALUE

In valuing businesses, there are a number of different approaches. Market based methods such as Price/Earning (P/E) multiples are most commonly used for pricing public share offerings. Such valuation methods reflect the collective view of the market on future performance of the industry and the business, as well as various risks faced by the business.

P/E multiples can be influenced by a multitude of factors and the perceived risks associated with them, including degree of competition, quality of management, regulatory environment, leverage/capital structure, expected market growth potential and relative market position, asset quality, potential for stranded costs, stock market conditions/trends, political/social environment, investment attitude towards the industry, and technology advances in the industry.

Generally, in a mature industry, the more uncertain the company's future earnings, the lower the P/E multiple.

Historically, many large privatizations were consciously "underpriced" to a degree in order to ensure a successful offering and a strong investor following over time. This is true for the electric utility privatization in Britain and the recent privatization of CN. However, valuation is an outcome of the risks and rewards assessed/perceived at the time of share offerings and retrospective reviews are of limited use in future valuation efforts. As for any share offerings, the timing for privatization and associated

marketing efforts will be important to ensure that the best value is obtained.

Current P/E multiples for regulated electric utilities operating as regional monopolies are approximately twelve times for Canadian utilities, and thirteen times for US electric utilities. The "right" multiples for new entities resulting from the ownership change operating in a competitive environment will likely be somewhat less than these levels. Until future industry structure is better defined in terms of degree of regulation and competition, a high degree of judgement will be required to determine the appropriate P/E multiples in the valuation process.

PUBLIC FINANCE

A change in the ownership of some of Hydro's generation would have an impact on public finances in the Province. Depending upon how Hydro's current debt is discharged or defeased, the Provincial Government (which guarantees that debt) would see a reduction or elimination of its contingent liability relating to Hydro. Clearly it is better to have no liability than a contingent one. There is no evidence from credit rating agencies that Hydro is currently a drag on the creditworthiness of the Province. However, the reduction or elimination of the Province's contingency liability could insulate the Province's credit rating from any potential deterioration in the future if the ability to service Hydro's debt is perceived to be at significantly greater risk in a more competitive environment. The government's contingent liability could continue for a while after privatization, should it agree to a staged defeasance of the existing debt to facilitate the ownership transfer.

Privatization can result in changes to the revenue streams to the governments. Removal of the debt guarantee would reduce revenues to the Provincial Government from the debt guarantee fee (\$174 million paid by Hydro in 1994). Conversely, one might expect increases in water rental payments (\$110 million in 1994). The most significant revenue impact would result from the change of tax status which should generate significant tax revenue for all levels of government – municipal, provincial and federal. This could result in an annual transfer in excess of \$1 billion should all parts of Hydro be privatized.

As a result of the ownership transfer, the provincial and municipal governments may receive cash proceeds, with the balance going towards paying down the remaining Hydro debt. To maximize cash proceeds and reduce debt in the remaining entity under public ownership, government could consider putting in place for investors certain guarantees or supply contracts, or agree to various concessionary arrangements. However to do so would slow down the pace of promoting more open competition and its associated benefits to electricity consumers.

LABOUR ISSUES

With any sale, lease or transfer of all or part of the business, the successor rights provisions of federal and provincial legislation in place at the time will apply. Under current legislation, relevant portions of the collective agreements in place at the time of the ownership change would carry over to the new employer, and would remain until changed through negotiations. Successor rights will also have to be addressed

in the event of a merger, such as that being contemplated in the retail and nuclear areas.

Ontario Hydro has a number of collective agreements and accords with its unions covering professional, industrial and construction workers. The MEUs and other potentially affected employers will have similar agreements and union representation, and the successor rights issues of all the unions involved will be a significant issue to address. The impact on Ontario Hydro's pension plan, which is governed by the PCA, the Pension Benefits Act and the Income Tax Act, will also be an issue to address.

Ownership change would further drive economic efficiencies in the industry, enhance the viability of the industry and therefore enhance the prospects for people working in it. Together with the move from a monopoly structure to a competitive market, all competitors would be under pressure to minimize variable costs such as labour costs, more flexible working conditions and continuous productivity improvements in all areas. As the customer takes centre stage in a competitive market, every employee must become more customer oriented to retain/expand business on an ongoing basis.

It must also be recognized that rationalization of parts of the industry will likely result in some employee dislocation. The government may want to look at the impact on employees across the industry, and could consider mitigating the potential adverse impact on workers through retraining, redeployment, or other initiatives.

LEGAL ISSUES

Hydro, as a creature of statute, cannot implement privatization plans in isolation. For instance, the PCA does not give Hydro the authority to sell a generating station. Hydro does have the authority to sell surplus real property or electrical, hydraulic or other machinery, appliances and apparatus, but it was not contemplated that a generating station, the operation of which has been authorized by Order-in-Council, would be sold as a going concern. (Of course, the government could amend the OIC or enact legislation to permit the sale.) This is a simple illustration of the need to wholly reform the legislative framework for Hydro, if any change in ownership is contemplated.

Changes to ownership raises a number of practical legal questions, which likely can be resolved by legislation or negotiation. For example, water rights, including the water rental fees, have been granted to Ontario Hydro. If hydro-electric generating stations were sold, the transfer of these rights to private interests would require federal and provincial government negotiations, aside from any public policy concerns that this would raise. Also, nuclear licences issued by the AECB for operation of nuclear stations are not transferable with the station, and would need to be applied for by a new owner.

PUBLIC POLICY ISSUES

A key element of the past rationale for public ownership of the industry has been that electricity was a critical factor in the economic development of the Province and an important instrument for the promotion and implementation of various public policy goals. The possible

transfer of ownership to the private sector raises the question of whether such a move will weaken or impair the ability of government to continue to pursue these objectives. Most of North America's major hydroelectric plants are in public hands; this is particularly true in Canada. From a public policy perspective, a comparison of recent privatization efforts in two maritime provinces is instructive. Nova Scotia's privatization in 1992 found widespread public acceptance; that system is predominantly fossil fuelled. In contrast, the Newfoundland government's efforts in 1994 to introduce the prospect of privatizing that province's power system, almost exclusively hydroelectric, ran into significant public opposition and was abandoned at least for the time being. Certainly, the issue of water, watershed management, potability, foreign sales, etc. is an important public policy issue that needs to be carefully considered in any ownership transfer.

Public attitude research indicates some public concern about the sale of nuclear facilities as well. This concern revolves around a perception that, even under identical regulatory oversight by the AECB, privately owned nuclear plant may be operated on a weaker standard of safety or that safety, might be compromised by a drive for efficiencies and profit. Any considerations to the sale of nuclear will need to address such public concerns.

With respect to private sector companies serving public policy initiatives, such as sustainable development, over 100 major private corporations in Canada have chosen a

sustainable development strategy. These corporations believe that sustainable development is good business and it contributes to their competitive advantage.

Where economic or market mechanisms are not in place to elicit environmentally responsible behaviours, compliance with public standards can be achieved through an effective regulatory regime. A change in ownership does not diminish government's ability – should it so decide – to intervene through its regulator and alter the structure or operation of the market. Government need not be directly involved in managing or owning the industry.

Achievement of "public good" objectives can also be effectively achieved through the provision of incentives to prompt appropriate behaviours.

VIII PUBLIC POLICY CONSIDERATIONS

In 1996 Hydro celebrates its 90th anniversary. The history of Ontario's power sector is indistinguishable from the history of the Province in the 20th century, and therefore fundamental structural changes to the industry will have significant public policy implications.

Replacing a monopoly with a marketplace means gaining advantages such as innovative and creative behaviour while losing a degree of comfort which comes from not having to make choices, and with having ready instruments for public policy intervention. The public and consumers must be satisfied the gains are real and adequate before they will sanction change.

Earlier versions of our proposal suggested moving to direct retail access, which would remove the monopoly supply franchise from Ontario Hydro and the MEUs – a move that would have major public policy implications. In this update, we introduce two new features with equally significant public policy impacts: the creation of a single publicly held transmission and distribution "wires" company (Wiresco) and support for moving ahead with privatization of generation.

Both raise the issue of ownership of the existing infrastructure. Some MEUs claim ownership of Ontario Hydro on the principle that it is the MEUs which have largely contributed Hydro's equity. This view has been repudiated by the Supreme Court and cannot be substantiated in law; nonetheless, many MEUs show their contributed equity to Hydro in their financial

statements, and the claim to ownership has a long history in public policy in this province. Certainly, it is true that the same customers who contributed the MEUs' equity contributed Ontario Hydro's. In order to sell some of Hydro's assets, current ownership will need to be clearly established by the Province. In our view, it is the Province that should be seen as the most logical owner on behalf of all those who have contributed the equity in the current infrastructure.

THE PRIVATIZATION ISSUE

Some of the public policy implications of the sale of some of Hydro's nuclear and hydroelectric generation are also noted in the Ownership chapter. Historically, Ontario Hydro was one of the first of the large, nationalized public utilities; it was the model for the Tennessee Valley Authority in the 1930s; France began its drive to a nationalized power sector in the 1930s; Quebec followed suit in the 1960s. Hydro was created by a Conservative government in an era of state intervention; the same government created the Workman's Compensation Board, for example. Public ownership is implicit in Hydro's charter motto "Dona Natura Pro Populo Sunt" - The Gift of Nature are for the People.

The trend towards denationalizations of public corporations around the world³ in the 1980s and 1990s sets the global context for privatization issues related to Hydro. Various academic studies can be found to support both the view that public ownership is more efficient and private ownership is more efficient. Recent

federal privatizations (Air Canada, Petro Canada, Canadian National) in the transportation and energy sectors, attracted little public censure. Yet these cases require careful study, for all were done in the context of the federal government shedding a liability, and in industries where crowns were already competing with more successful, investor-owned rivals. It remains to be seen whether Hydro's sale would be viewed in the same way, since Hydro is only a contingent not a direct liability to the Province.

The privatization of the industry in the UK was accompanied by the introduction of competition (unlike in Nova Scotia, for example) and that fact grounded much of the public support for the change. In this sense, the timing of the sale of Hydro generating assets relative to the introduction of competition may make a difference in its public acceptability. Linking privatization to competition (either concurrent or as an inevitability) may make the former more acceptable.

The September version of this proposal was "agnostic" on the ownership issue; however, with changing structures and new entrants, it seemed inevitable that ownership would change. The September proposal suggested that, perhaps as an interim step, functional disaggregation would adequately address most of the market power and self-dealing concerns. The September paper noted that crowns can compete, in the way that the CBC runs competing networks, or that municipalities or universities compete. Hydro's September approach to ownership permitted later

rebundling in new formations, and was reflective of both regulatory trends in the US (FERC's NOPR leads to functional unbundling but does not require separate ownership) and merger and acquisition activity in the US and UK (where more, not less, vertical integration is occurring). However, in this proposal, we suggest that actual divestment and different ownership is required in order to encourage true intra-Ontario competition. How would Ontario react?

Attitude research shows a continuing public regard for Ontario Hydro, which is perceived more as an "institution" than a "company" (akin to the CBC) in this province. Ontarians are wary of foreign ownership of their electricity supply, although they believe a measure of competition would be a good way to enhance Hydro's accountability and responsiveness. Other consumer views on privatization can be found in Chapter III, Section E.

There could be significant public opposition to the sale of hydroelectric and nuclear. In combination, Hydro's nuclear and hydroelectric assets account for 21,000 MW of capacity and about 90% of Ontario's electricity

Ontario business leaders are likely to support privatization of some of Hydro's generation; many will recognize that electricity is becoming a commodity market in North America and most of North America's generation is investor-owned (including most of North America's nuclear generation). However, others will question the benefits of turning low cost and low risk assets such as hydroelectric resources over to the private sector particularly if there turns out to be

a tightening market and the possibility of increasing market clearing prices. Still others will suggest that the sale of hydroelectric resources at such a time is simply transferring a natural birthright for Ontarians into private hands; the issue of water and watersheds is always a potent public policy issue, and particularly for aboriginal peoples. This – along with the fact that in Canada most major hydroelectric plant is in public hands while much of the fossil plant is investor-owned – suggests that the sale of fossil plant might meet the least public policy resistance of all the generation divestment options.

With regard to nuclear, while there is ample US and Japanese evidence about the safe and efficient operation of investor-owned nuclear generation, the Ontario public is likely to express considerable concern over what may be perceived as loss of public control of this technology. The root of this viewpoint will be found in fears that public safety will be compromised by private operators (although owners with their own capital at stake will not be eager to jeopardize either their relationship with regulators or the viability of their investment). There will also be public concern that the government cannot and should not shed its responsibility for long term waste management, and therefore the entire industry should remain under direct government control.

In general, community leaders and key stakeholders are likely to see the increasing non-government ownership of Ontario's power sector as a good thing in and of itself – particularly if accompanied by competition, but also a

welcome distancing of the industry from government intervention. For most of its history, Hydro has been used as a direct instrument of government participation in Ontario's economy, often as a counter-cyclical economic driver (eg, the role of Darlington in the BILD program of the early 1980s). This is not restricted to recent years. From the building of Sir Adam Beck I in the early 1920s to Atikokan GS in the 1980s, from the signing of the Elliot Lake uranium contracts in the 1970s to withdrawing from them in the 1990s, Hydro has been a significant political and economic lever in the Province. Whatever the merits of being manoeuvred in this way historically, when electrification of the Province was a clear and inarguable social necessity, most community and business leaders today are likely to support distancing a mature industry such as the power sector from either overt or covert government intervention. They would no doubt prefer the use of more typical techniques for public policy needs such as regulation and taxation.

It is likely that the increasing privatization (through increasing the share holdings by investors) of Ontario Hydro International Inc and Ontario Hydro Technologies would be widely supported by the public as a good way to lever their investment in Hydro's expertise with private sector marketing and entrepreneurial skills, in at least a transitional public/private partnership.

THE WIRESKO ISSUE

This proposal recommends that a Wiresko be owned by those entities which contributed its assets. From a public policy perspective, this

means that the Municipalities will have significant ownership of an integrated provincial Wiresco, which to some degree is responsive to the view that some MEUs hold regarding their ownership of all of Hydro. An early draft of the MEA's Institutional Options study suggested that the GRID company should be owned by the municipal utilities.

Ontario's lengthy and unique history of encouraging municipalities to create local distribution electric utilities conflicts with the Wiresco proposal, and this will no doubt create significant reaction from some municipalities, MEUs, and others. While virtually all observers would agree that rationalization of the distribution sector is needed in Ontario, previous attempts at rationalization have encountered the same opposition that efforts towards municipal regionalization and school board rationalization have experienced in the past.

It is likely that general consensus on the "right" number of local distribution utilities will be extremely elusive, and therefore the Province will have to settle the issue through legislation. In one regard, the creation of Wiresco is easier in Ontario than in other jurisdictions in that the current infrastructure is almost entirely in public hands and the Province has full legislative authority to decide on a new structure.

Given that most Ontarians do not distinguish between Hydro and their local supplier, rationalizing the distribution function might be seen to be a welcome step by a government and power consumers interested in promoting efficiencies in the public sector. It is unlikely anyone would

insist that people need more local control over their power distribution (which typically accounts for about 15 per cent of their power bill) than they need over, for example, the education of their children, yet there are today almost three times as many MEUs as local school boards in the Province⁴.

A variant on the single Wiresco as a way of imposing a rationalization on the fragmented distribution system would be creating some number – many have suggested about a dozen – independent regional distribution entities, much like the UK Regional Electricity Companies (RECs). This has been advocated by several stakeholders and would clearly go a very long way towards effecting the required efficiencies.

Still others suggest that the "right" criterion for establishing a local utility is that it have the assets and expertise to take power at high voltage (115 kv or up); this would suggest about 60 local utilities in the Province. Various observers have suggested "optimal" numbers of customers for a distribution utility, ranging from about 100,000 to one million. The latter would mean four major distribution utilities in Ontario. And yet, for the reasons proposed in the Competition chapter, we suggest that creating a single common carrier (albeit with regional service centres) is the most effective solution.⁵ It is also important to note that a single Wiresco is most likely to encourage the development of the smart and interactive T&D system with a degree of equitability across the Province.

It should be stressed that by definition, retail access offers the ultimate in local control – the

choice of supplier by all customers. To introduce retail access means the MEU's (and Hydro's) supply franchises must be revoked. But throughout history, apart from a very few examples of municipal generation, MEUs have been obliged to purchase power from Hydro; so that "local control" has been merely over local wires operations and billing. Having the municipality part owner of the new, province-wide Wiresco may help ameliorate some concerns in this regard.

To understand this issue of local control, it is important to note that elections for MEU commissioners do not receive the same degree of voter participation as other municipal elections, and municipal elections have less participation than provincial elections. In both large and small municipalities there is not a great deal of turnover as a result of MEU commissioner elections. In the smaller communities, the prevalence of incumbents is matched by a high degree of acclamations. It may be that Ontario's electricity customers do not see voting for their commissioners or councillors as a very direct way to influence their electricity service.

This proposal for a direct retail access market structure, combined with a single provincial Wiresco as a common carrier providing transmission and distribution, challenges the continued role for local MEUs, at least as they have been historically configured. Municipalities could, of course, offer their constituents power brokerage services, which might be located in the MEUs; similarly, the MEUs might offer energy services (billing, demand management, etc) on an elective basis to its citizens.

The September version of this proposal, suggested that the introduction of market forces and the removal of the supply franchise would in and of themselves create enough pressure for retail distribution rationalization. Our position on this has evolved to the point that we now suggest such a bottom-up strategy for retail competition is unrealistic.

There is no legal mechanism for MEUs to give up their monopoly. They would essentially have to be voted out of existence, since to create a MEU, the PCA requires a local referendum. The PUA requires the same for the dissolution of a MEU. Even if a MEU wanted to proceed in such a direction, commissioners would have to be elected by campaigning in favour of it; this would effectively require people running for commissioner posts on a platform to put the MEU out of business.

It would be unrealistic to suggest such a process would be followed, where a majority of commissioners is elected on such a platform, let alone repeating this process in enough MEUs so that adequate provincial retail access and distribution rationalization might become a reality. This difficulty means that structural change is required, and such change cannot effectively be implemented incrementally. It requires political direction, which in this instance can only come from the top. The current distribution system in Ontario was established at the turn of the century by meshing nineteenth century statutory provisions for local municipal services with twentieth century objectives of economic development. These statutes have to be redrafted to permit the technological possibility of real retail competition in the power sector.

In summary, the original impetus for creating the unique MEU structure in Ontario was to put electricity distribution into public hands. This restructuring proposal retains that feature at least for the time being. It was also important to have electricity retailing separated from other municipal services to prevent cross-subsidization; nothing in this proposal changes that. Local wires have always been subject to provincial regulation; this proposal does not change that. Originally it was felt that municipalities should exercise a measure of local control over retail supply; this proposal for retail access improves upon it by allowing customer choice to all of a municipality's citizens.

THE COMPETITION ISSUE

Ontarians view electricity not as a commodity but as an essential service, and therefore are concerned about the manner in which it is provided. Despite a growing recognition among opinion leaders that Ontario's commodities must be traded on an international market, and that Ontario cannot remain an island in such commodity markets, there is a continuing belief in Ontario that certain public services (education, health care, etc) must work to provincial, not North American, standards. The degree to which electricity is seen as one of these essential public services will determine the acceptability of opening the Ontario market. In any case, the power sector will require a made-in-Ontario solution.

The issue arises when consumers register their concern about reliance on foreign power supplies or even on having generation owned by non-Canadians.

However it is difficult to gauge Ontarians' views about competition in electricity supply, just as it is when competition is introduced in any fixed link commodity (such as gas or telephone). Consumers know that it would be uneconomic to have more than one pipeline or phone line and therefore initially do not understand the nature of a market where a common carrier is accessed by different suppliers. This changes as competition is introduced and accepted. No doubt from a public policy perspective, the power sector will benefit from not being "first mover" among fixed-link commodities in the introduction of competition.

Just as we know that consumers value above all else reasonable pricing and reliability, the introduction of competition in this industry will be judged by how well those two aspects perform in the new structure.

Because commodity markets are complex adaptive systems, it is impossible to predict with any degree of accuracy or assurance what will happen to prices in an open market for electricity, other than to suggest that a market will provide better economic signals in general than a closed one, and thereby – long-term – will mean a more efficient sector overall. Straight-line projections offer no reliable "base case" against which the effects of competition might be modelled in advance or judged once in place. Introduction of competition in the electricity sector cannot be predicated on a promise of lower prices; rather the argument is simply that it will ensure better economic signals long-term and competitive prices relative to the surrounding marketplace.

Similarly, some consumers will express concern that introducing competition will affect the overall reliability of the power system and their supplies. Given appropriate market rules and an effectively authorized Central Market Operator, this concern is unwarranted. Despite dire warnings from the CEGB, a competitive market has operated reliably in the UK since its inception. However, there will be a nagging public perception that reliability will erode as the obligation to supply disappears. In Hydro's proposal, the Price Averaging Pool will no doubt offer some comfort to those who do not wish to actively participate in the market.

The most profound issue with regard to introducing competition in electricity services will be providing concrete assurance that some legislated or regulatory mechanism will prohibit undue price discrimination particularly against rural and remote communities. This is a sine qua non of public acceptance of structural change for our industry in Ontario. Even in Toronto, where consumers are assured of reasonably-priced supplies, they insist that there be a measure of fairness and protection elsewhere in the Province. Whether this mechanism is provided by some continuing form of explicit cross-subsidy such as the current Rural Rate Assistance, or an energy tax, or through rebates, equalizing transmission and distribution tariffs, or by something like the Price Averaging Pool, the Province will have to provide some simple and understandable way to demonstrate that a measure of equitability is retained even as the risks and benefits of an open market are introduced.

In order for the market to be truly efficient, and for economic signals to be clear, there will have to be differences in regional pricing for transmission. It will simply cost more to provide power in certain regions than in others. But it is also true that transmission tariffs will need to be such that new generation is encouraged in areas of generation deficit and discouraged where there is a surplus. Regional disparities in transmission prices can be moderated by regulatory intervention where appropriate.

One of the features of an open North American market which will raise public policy issues is the evaporation of any meaningful distinction between customer classes and between primary and secondary sales. Customers will access retail agents or generators directly and their ability to do so will depend on the business savvy and the nature of the customer or agent, not on some arbitrary "class" division based on size of demand. Similarly, with opened borders, there will be no need or ability to distinguish between intra and inter provincial or national sales. Other aspects of this issue are discussed in Chapter VII under "Regulation in the Two Path Structure."

A major, traditional policy issue in power sector regulation has been intergenerational equity – because such massive capital requirements are financed by public borrowing, and because facilities last so long, ensuring that the users are those who pay has been a complex regulatory task. In the new architecture, this issue will diminish in lock step with the reduction of stranded assets; thereafter, investors and customers contract for risk and benefit, and new

plant addition will be much more specific to customer demand. This will mean marketplace forces will dictate customer risk and benefit, not regulators or planners.

Some Ontarians will be concerned that the distancing of the power sector from government control either through privatization or the introduction of competitive market forces will reduce the attention paid to environmental and sustainable development issues. While this need not be the case (see appended paper, "SED and Competitiveness") the restructured industry will have to take particular care to demonstrate its sensitivity and progressiveness in this area. Regulators also will have to ensure that market mechanisms are put in place that encourage procedures friendly to sustainable development, such as emissions trading. Overall, behaviours designed for success in a competitive world are likely, over time, to include even more powerful drivers for internal efficiency, pollution prevention, and adherence to environmental standards such as ISO 14000 to become a preferred supplier.

Some industry observers suggest that demand management measures are likely to suffer in an open marketplace. But some of these top-down and imposed programs often were of doubtful economic validity and raised serious questions about overall social good, free ridership, etc. Many demand management activities and services will be very marketable, to the degree that they assist the customer in reducing her energy usage and bills, and enhance the customer's own "greenness". Better, more sustainable behaviour is likely to be driven when

the customer wants it rather than when programs are offered as "free goods". There is every reason to believe that demand management will survive and prosper when the economic signals are clear and motivated by consumer needs.

In summary, from a public policy perspective, the feasibility of the introduction of competition into Ontario's electricity services industry will depend on Ontarians being willing to replace central planning and obligation to serve with the forces of commodity and service markets which they already allow to ensure reliability of other essential supplies.

KEY PUBLIC POLICY CRITERIA FOR RESTRUCTURING

The following criteria will be of interest to public policy makers in any restructuring of the power sector.

1. Improve the Overall Competitiveness of the Ontario Economy

The general impacts of any new structure for the electricity industry must be that in sum the Ontario economy benefits. Options that promote competitive rates and pricing should be considered advantageous.

2. Ensure Universality of Service

Any future structure must ensure that electrical service remains available across the province at affordable rates.

3. Ensure Equitable Rates

Large discrepancies in available rates and prices among like customers must be

avoided. Major regional differentiations must be discouraged.

4. Transparent Obligation to Supply

Appropriate structures will locate the obligation to serve and the accountability for supply clearly with a particular party or group of parties.

5. Improve Customer Choice

Preferred models should enhance customers' abilities to choose from a range of product and services. A degree of customization to suit individual customer needs will be required, for example, in rates.

6. Reliability/Quality of Service

Appropriate options should ensure continued reliability – both in a planning sense and in a daily supply sense. The quality of service from the provider should be enhanced.

7. Sustainable Energy Development

The best models will ensure efficient and non-wasteful use of the products and services. Greater electricity usage should be in the context of overall energy efficiency. The production and consumption of electricity should be increasingly efficient as the result of any choice of structural models.

8. Avoidance of Stranded Costs

Preferred models will avoid making unpaid-for infrastructure investments unproductive.

9. Ensuring that Market Prices Drive Costs

Appropriate models will ensure that having market-set pricing will influence costs incurred – ie, expenditures will be less than the revenue available from customers.

10. Commercial Flexibility, Opportunities for Growth

Appropriate models will ensure all parties can compete for growth and new business opportunities equally.

11. Equitable Regulatory Architecture and Objectives

Appropriate models will ensure regulatory fairness over all players.

It should also be noted that any movement to a full direct access structure brings with it the demise of the obligation to serve, and the concomitant rise of financial markets, where future electricity supply can be bought as futures, hedges, or derivatives. Effectively, "insurance policies" replace the utility's obligation to serve. It remains to be seen how well such an arrangement will survive an era of supply deficit, as opposed to surplus.

Market behaviour in a condition of surplus or deficit is therefore an important consideration in deciding the public policy attitude towards the industrial structure for that industry and the architecture of its regulatory oversight.

